This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

SCHOOL AND HOME EDUCATION MONOGRAPHS

UC-NRLF
$B 303 462

d WHIPPLE, EDITORS

umber Two

CORPORATION SCHOOLS

BEATTY

PUBLIC SCHOOL PUBLISHING COMPANY
BLOOMINGTON, ILLINOIS

SIGILLVM · VNIVERSITATIS · CALIFORNIENSIS
LVX
FIAT
MDCCCLXVIII
EX LIBRIS

SCHOOL AND HOME EDUCATION MONOGRAPHS

Edited by
W. C. BAGLEY AND GUY MONTROSE WHIPPLE

No. 2

CORPORATION SCHOOLS

by

ALBERT JAMES BEATTY, Ph. D.
Bureau of Salesmanship Research,
Carnegie Institute of Technology;
Director of Education,
The American Rolling Mill Co.

UNIV. OF
CALIFORNIA

Public School Publishing Company
Bloomington, Illinois
1918

LC5051
B42

COPYRIGHT 1918 BY
PUBLIC SCHOOL PUBLISHING COMPANY

CONTENTS.

Preface.

Introduction by W. C. Bagley.

Part One

Chapter

I. Introduction: the problem, the purpose, the plan, the limitations, the organization of material.

II. Historical Sketch of Apprenticeship: the rise, the growth, and the decay of the gild apprenticeship system.

III. Public and Private Trade Schools and the Corporation School: the rise, the growth, the organization, and the present status of the factory apprenticeship school, the National Association of Corporation Schools. Typical Schools.

Part Two

IV. The Efficiency of Corporation Schools as Tested by the Business Concerns which Maintain Them: the five purposes for which the corporation school is maintained, conclusions.

V. Comparative Efficiency of Corporation Schools as to Instruction: The Teachers' Efficiency Score Card, the scoring of teachers, tabulation of results, conclusions.

VI. Comparative Efficiency of Corporation Schools as to Motivation of Work: the motives available for different types of schools, the theory of motivation, conclusions.

VII. Comparative Efficiency of Corporation Schools as to Curricula and Courses of Study: the essential features of curricula, sample curricula, conclusions.

VIII. Comparative Efficiency of Corporation Schools as to Textbooks and Lesson Sheets: the essential features of a good textbook, textbooks and loose leaf lesson sheets discussed, the faults of each, conclusions.

PART THREE

IX. Summary of Conclusions,—The Coöperative School, a Solution of the Problem of Vocational Education.

UNIV. OF CALIFORNIA

LIST OF TABLES, ILLUSTRATIONS, and CURRICULA

Table

I. Summary of time spent and list of particular investigations.
II. Corporation continuation schools.
III. Coöperative special training schools.
Teachers' Efficiency Score Card.
IV. Comparative scores made by five students.
V. Scores of eighteen corporation school teachers.
VI. Scores of twenty-one teachers in public secondary schools and technical schools.
VII. Graphical representation of the data of Tables VI and VII.
VIII. Coöperating companies and schools.

Curricula

A. Mechanics' short course, Packard Motor Car Company.
B. Students' training course in stock room, Western Electric Company.
C. Engineering for college graduates, Western Electric Company.
D. Bridge Engineers, American Bridge Company.
E. Union School of Salesmanship, Boston.
F. Electric Engineering, University of Illinois.
G. Scientific, Crane Technical high school, Chicago.

INTRODUCTION

The corporation school has been an interesting and significant development of American industry and American education. It has come in response to a real need,—a need that was not adequately met by existing educational agencies. Its growth has been almost entirely independent of and apart from the existing machinery of public education, and for this reason its achievements are little known and still less appreciated among public-school workers. But to these workers and to other students of education the corporation school should be full of significance, not only because of the light that it throws upon the puzzling problems of vocational education, but also because of its unique contribution to general educational theory. The relation of the economic motive to efficient learning, the educational value of the "project," the relative significance of "aptitude" and "attitude,"—these and other questions discussed in Mr. Beatty's monograph lie very close to the fundamentals.

Nor is the development of the corporation school without interest from the more broadly administrative point of view. Every form of organized educational endeavor must be a matter of concern for the state. From every point of view, the direction and control of educational agencies by the public is to be preferred in a democracy to private or corporate direction and control,—provided, of course, that educational efficiency reaches the same standard in the two cases. It is Mr. Beatty's contention that the coöperative and continuation schools could be made to reflect the principal virtues of the corporation schools and that the development of coöperative arrangements that will link the public schools with the industries and occupations constitutes the most promising line of progress in the development of vocational education. Whether or not one agrees with this conclusion, it is well that there is now available this careful and comprehensive study of what the corporation school has accomplished.

Mr. Beatty's investigations were made under the direction of the late Professor Charles Hughes Johnston, and such substantial contributions as this will be the tribute that would have pleased the teacher most could he have lived to see the fruition of his work.

W. C. BAGLEY.

New York City.
January 15, 1918.

PREFACE

The problem of vocational education is one of the most insistent of social-economic questions, and while the importance of this problem has been growing in the public consciousness for the past two decades, it still awaits a satisfactory solution.

The difficulty of the problem becomes apparent when we recall that its solution has been attempted at different times by practically every important social, political and economic organization in the land. The family, the church, the gild, labor unions, manufacturers associations, and chambers of commerce, the school, the municipality, and the state, have all proposed and tried plans for vocational training; and while these organizations have accomplished something for individual cases or larger groups, and have added their part to the cumulative experience out of which the solution of the problem must finally come, the ultimate solution is not yet in sight.

Those who have offered solutions for the problem may, without great violence to the facts, be credited with praiseworthy motives, yet the history of the struggle for vocational and industrial education has not been without its conflicts between different and sometimes opposing interests. There have been many misunderstandings, misinterpretations, jealousies and incriminations.

One of the most persistent and most bitterly waged of these conflicts has been that between the employers of labor on the one hand and the employees on the other. Ever since man reached that stage in economic development when one man, either by brute force or by more diplomatic means, was able to subdue his fellow and command his services, there has been in evidence the selfish and unscrupulous employer who has wrung from his workers the last drop of life blood, for the least wage which would make them profitable; while on the other hand, there has doubtless always been in evidence the time server and the shirk.

Out of these conflicting interests which date back to a time so remote that the memory of man runneth not to the contrary, there has grown the modern conflict between capital and labor; and one of the most important phases of this conflict long has been, and still is the question of vocational training.

Capitalist and philanthropist have not always been embodied in the same individual, but even when they have been so united, and an honest effort has been made to provide adequate training for industrial workers, there has always been the fear on the part of the workers that this apparent and specious philanthropy was in reality only an effort to make the working class more subservient and more profitable to their employers.

Whether this fear has been justified is not the province of this treatise, but its existence and its influence must be noted. Perhaps the best statement of the attitude of organized labor toward this question was made by President Samuel Gompers of the American Federation of Labor.[1] He says, "A great part of my life has been devoted to combating wrong notions about the attitude or organized labor toward social and economic questions. . . . Organized labor does not oppose the development of industrial education in the public schools but is eager to coöperate in this reform. (The working man has too little time and can therefore take little interest in any other sort of education,) but it will continue to oppose the exploitation of labor, even when that exploitation is done under the name of industrial education.

"Organized labor cannot favor any scheme of industrial education which is lop-sided—any scheme which would bring trained men into any trade without regard to the demand for labor in that trade. Industrial education must maintain a fair and proper apportionment of the supply of labor power to the demand for labor power in every line of work. Otherwise the advantage will be neutralized. If, for example, the result of industrial education is to produce in any community a greater number of trained machinists than is needed in that community, those machinists cannot derive any benefit from their training since they cannot obtain employment except at economic disadvantages. Under these conditions industrial education is a distinct injury to the journeymen who are subjected to keen competition artificially produced.

---

[1] **Eighth An. Conv. N. S. P. I. E.**

"Industrial education must meet the needs of the worker as well as the employer by maintaining an equilibrium of supply and demand of efficient artisans.

"How shall such an equilibrium be maintained? The answer seems obvious. There is only one way to avoid this difficulty in spite of the very best intentions to benefit labor. The only way to avoid working an injury to labor under the name of industrial education is to find out what is the demand for labor in the community. Industrial education should in every instance be based upon a survey of the industries of the community. Upon such a basis the public schools may properly provide for the particular industrial needs of the community, benefiting both the laborer and the community. I can assure you that nowhere will working men oppose such an effort to make our schools more democratic in serving the real bread and butter needs of the community.

"Organized labor has been for years active in its effort to make the public schools do precisely that which some misinformed people even think labor opposes. In 1903 the American Federation of Labor at its annual convention appointed a committee on education, and the sort of education which was under consideration when this committee was appointed was industrial education. The members of the trade unions felt the need of industrial education, and this sort of education was not provided by the public schools. The trade unions whose members paid taxes to support the public schools were not getting the sort of education which would enable them to become skilled, efficient and better paid workingmen. They were getting, in so far as they got any thing at all, a sort of education which had for them very little value, and they therefore considered the possibility of a scheme of education which would be of value to them.

"Now when the public school comes forward with propositions to provide the sort of education needed by workingmen, they will welcome any such development.

"In 1904, and again in 1905 and 1906 the American Federation of Labor resolved that 'We do endorse any policy and any society, or association having for its object the raising of the standard of industrial education'. These committees resolved in favor of 'the best opportunities for complete industrial and technical education'. In 1909 a resolution was adopted stating that 'since technical education is a public necessity it should not be a private but a public function, conducted by the public and supported by the public'.

"Documentary proof that organized labor has for years been actively in favor of industrial education in the public schools is found through all the annual reports of the American Federation of Labor beginning with 1903 and extending to the present time."

One of the organizations approved by the American Federation of Labor for its activity in fostering vocational education is the National Society for the Promotion of Industrial Education.

This society organized in 1906 has taken a leading part in securing municipal, state and national legislation for vocational education. The work of the Society is founded upon the following principles:

(1) The state should have the responsibility for the training and educational welfare of all children until they become at least sixteen years of age.

(2) No child under sixteen years of age should be permitted to go to work unless he is at least fourteen years of age and has reached a minimum educational standard not less than that necessary to meet the test for entering the sixth grade of the regular schools or its equivalent.

(3) All children between fourteen and sixteen years of age should be compelled either to attend school or to enter employment, and when not employed should be required to return to school.

(4) Specialized forms of vocational education should be provided for children over fourteen years of age who desire or need such training.

(5) Where state-wide action is not yet practicable, local communities should be authorized by law to decide either by a referendum to voters or by the action of a local board of control, whether children between fourteen and sixteen years of age, employed during the day, should be required to attend part-time classes for a period of not less than four hours a week out of their working time.

(6) As fast as conditions permit, we should move in every state toward state-wide compulsory part-time education for those between fourteen and sixteen years of age, who are employed as wage-workers.

The most important single result for vocational education which the Society has helped to attain is the passage by Congress in February 1917 of the Smith-Hughes Bill for Vocational Education. This law provides for Federal aid to the states which decide to avail themselves of its provisions. This aid from the Federal government is for three specific purposes: (A) Salaries for agricultural teachers, (B) Salaries for trade, industrial and home-econômics teachers, and (C) Training of teachers of vocational subjects. It is provided that the Federal aid shall not be more than half of the amount spent in any state for these purposes, and that before any aid is available from the Federal government, the state must first raise, appropriate and spend for vocational education an amount equal to that it proposes to secure from the Federal fund.

The effects of this Federal effort toward the goal of universal vocational training are not yet apparent. In the meantime, while this new organization is being put into operation, the present inadequate and cumbersome machinery for vocational training must still be kept in running order.

One of these recognized means of vocational education is the Corporation School, the subject of this study. This type of school had its origin in the failure of the older means of apprenticeship to supply an adequate number of trained men to meet the demands of the growing factory system, and in the failure of other and older educational institutions to assume the responsibility of supplying this training. The Corporation School is the answer of large business and industrial concerns to their own demand for industrial and vocational training.

The corporation school lacks many of the advantages of older and better organized educational institutions, but it enjoys a certain perspective and a distinctive attitude on the part of its students which compensates in a large measure for its evident limitations. These advantages, this perspective and this student attitude, make up an important part of this comparative study.

A. J. BEATTY.

Carnegie Institute of Technology,
Pittsburgh, Pa.

A COMPARATIVE STUDY OF CORPORATION SCHOOLS AS TO THEIR ORGANIZATION ADMINISTRATION, AND METHODS OF INSTRUCTION

PART ONE

CHAPTER I

INTRODUCTION

This volume is the outgrowth of the author's participation in the almost universal interest in vocational training which has developed in recent years amongst all classes of people. It describes a survey of a single type of organization for vocational education known as the corporation school. It is an investigation of the training of apprentices and other employees as this training is at present conducted by those business concerns in the United States which undertake to prepare their new employees for efficient service and their old employees for better service.

The purposes of this volume are: first, to trace briefly the rise and the decline of the old trade-apprenticeship system; second, to describe briefly the rise, the growth, and the present status of factory apprenticeship schools; third, to study the corporation schools of the United States from the point of view of their efficiency; fourth, to show how corporation school directors and instructors may make a greater use of such psychological and pedagogical principles as the experience of public secondary schools and technical schools has shown to be valuable; and fifth, to discover if possible in what manner corporation schools on the one hand and public secondary schools helpful in the solution of the problem of vocational education.

With these purposes in mind, the author has, during the past two years, personally visited a large number of corporation schools in the Middle West, studied their organization, visited their classes, and observed their methods of instruction; and from a much wider field than it has been possible to survey personally, he has examined in detail their textbooks and lesson sheets, their curricula and courses of study.

An adequate treatment of the corporation school movement requires first, a survey of the literature relating to such schools. This literature is not large, and consists mainly of magazine articles describing individual schools, in reports of surveys of vocational education made by governmental or local authorities, and in the volumes of annual reports of such organizations as the National Society for the Promotion of Industrial Education and the National Association of Corporation Schools.

A second preliminary step in the preparation of this volume was to initiate a systematic gathering of information both by personal visitation and by correspondence. Shortly after beginning to gather this information, the author learned that the National Association of Corporation Schools,[1] through one of its committees, was undertaking to gather practically the same information as that desired for this investigation, and an arrangement was made whereby the author assisted this committee in collecting, tabulating, and interpreting the data with the understanding that he might use for this volume any of the data collected. During the year 1916-17 the author has been a regularly appointed member of this committee and is still acting in that capacity.

---

[1] Refs. 19, 27, 31, 33. (References are numbered serially in each chapter.)

This appointment has been fortunate, for as a member of this committee,—the Committee on Special Training Schools,—the author has had the coöperation and advice of the other members of the committee who are recognized experts in this field. He has had access also to a vast quantity of the educational materials of these schools, and to much confidential information which he otherwise could not have obtained. He has also been the recipient of many favors at the hands of corporation officials and corporation school directors.

Throughout this investigation, comparisons have constantly been made with public school organization, administration, and practice; and an attempt has been made to discuss these observations in such a manner as to enable administrators and instructors of both public and corporation schools to profit, not only by their own inadequacies but also by the points of superiority of the other type of school.

This study has not been limited to the collection and evaluation of statistical data, nor have the conclusions reached been drawn wholly or largely from such data, though they are frequently reinforced by such statistical information as is available. Such a statistical study, if feasible, would be highly valuable, but the comparative recency of the corporation school movement, and the lack of a recognized system or uniformity in keeping the records of these schools make such a study impossible.

This is not a discussion of the need of industrial training. This need has already demanded and received a large place in the educational literature of the past three decades,[2] and numerous societies have been formed for the purpose of fostering industrial training.[3]

This is not a history of apprenticeship, though it has seemed necessary to preface it with a brief historical sketch of apprenticeship (Chapter II) as a background or point of departure. The history of apprenticeship is a most tempting topic, but that history has been written in a number of extensive studies,[4] and the real purpose of this study precludes more than a brief excursion into any subsidiary fields however inviting they may be.

---

[2] Ref. 2, Chap. VII. Refs. 24, 28, 29.

[3] Refs. 28, 30.

The material of this volume is organized into three parts: Part One, comprising Chapters I, II, and III is a preliminary survey of the field; Part Two, consisting of Chapters IV to VIII inclusive, is the main body of the work; Part Three, consisting of Chapter IX, is a summary of the conclusions reached and a discussion of them.

Chapter I sets forth the general plan of the investigation.

Chapter II is a historical sketch of apprenticeship. It traces briefly the rise, the character, and the causes of the decline of the old craft-apprenticeship; it emphasizes the economic and social character of the institution of apprenticeship, and the economic, social, and industrial evolution which has demanded a new system of apprenticeship.

Chapter III recites the principal causes which led to the factory apprenticeship system, and traces the establishment of private and public trade and technical schools and the factory apprenticeship school. This chapter introduces the materials and facts which have been collected by the author in his personal visitation of corporation schools. It treats of the organization and the work of the National Association of Corporation Schools and shows the growing interest of business concerns in the training of their employees. It describes the various types of corporation schools differentiated to meet different needs. It cites the fact that the trade apprenticeship school and the school of retail salesmanship touch two very large and important groups of workers, and suggests that so far as the interests of these groups are concerned, the point of helpful contact between the corporation school and the public school is to be found in some form of coöperative organization.

---

[4] Refs. 1-8.

Part Two presents the detailed information which the writer has collected in pursuing this study which has occupied a large part of his time for two years. The following summary shows something of the extent of the study, though it makes no account of the amount of committee work which the writer has performed.

TABLE I.

Number of corporation schools and company officials with whom correspondence has been carried on	49
Number of corporation school and company officials interviewed	41
Number of corporation schools visited	28
Number of public secondary schools and technical schools visited	19
Number of coöperative schools visited	8
Number of days spent in visiting corporation schools	10
Number of days spent in visiting public secondary schools and technical schools	20
Number of 'teacher efficiency' scorings made in corporation schools	19
Number of 'teacher efficiency' scorings made in public secondary schools and technical schools	39
Number of schools whose curricula and courses have been examined	46
Number of corporation school courses for which sets of lesson sheets have been examined	31
Number of 'corporation school' textbooks examined	27
Number of other textbooks examined	75
Number of corporation school classrooms and shops visited	44
Number of public secondary school and technical school classrooms visited	46

In Part Two the author undertakes to determine the efficiency of corporation schools: to compare the corporation school on the one hand with public secondary schools and technical schools on the other and to show how the work of these two types of schools may be mutually helpful in the solution of the problem of vocational education.

Chapter IV introduces the main part of the treatise and undertakes to show the efficiency of corporation schools as determined by such standards as are set up by business concerns themselves. The aims advanced by business concerns in the establishment of training departments are: first, to develop to the limit the efficiency of the individual employee; and second, to increase industrial efficiency in general. They determine this efficiency by the extent to which they contribute to the following results: first, an increased supply of trained employees; second, an increase in the number of men qualified for promotion; third, an improved product; fourth, a decreased turnover of labor; and fifth, less waste of materials and fewer accidents.

Chapter V describes that part of this survey in which the corporation schools have been compared with public secondary schools and technical schools in the matter of instruction. It describes in detail the "teachers' efficiency" score card which has been developed and which embodies the ten points used as a basis of making this comparison; and sets forth in detail the procedure and the results of this scoring.

Chapter VI is a discussion of motives. It treats of the various motives available for both types of schools, and undertakes to show that corporation schools have an advantage over the other type of schools in certain motives which seem to be inherent in the corporation school.

Chapter VII is a comparison of the courses of study and curricula used in corporation schools with those used in public secondary schools and technical schools. This comparison is based upon an examination of the outlines of courses and curricula found in the literature secured from these schools, and is made on three points: logical arrangement of courses and course-topics, time allotments to various courses and course-topics, and appropriateness of subject matter.

Chapter VIII is a comparison of the two types of schools as to lesson-sheets and textbooks. Such principles of textbook making as seem to be commonly recognized are formulated, and the lesson-sheets and textbooks which have been secured from both types of schools have been examined in the light of these principles.

Part Three, consisting of Chapter IX, is a consideration of the fundamental principles which govern the character of education in a democracy, and a discussion of the inadequacy of the corporation school in the light of these principles as a solution of the problem of vocational education. This chapter summarizes the conclusions reached in the chapters of Part One and Part Two, and shows how the coöperative trade and continuation school which may be made to embody the points of advantage of both corporation schools on the one hand, and of public secondary schools and technical schools on the other, offers the nearest approach to the solution of the problem of vocational education.

CHAPTER II.

HISTORICAL SKETCH OF APPRENTICESHIP

Business concerns have not usually been credited with philanthropic motives, and their assumption of the responsibility for the training of their employees has not usually been attributed to philanthropy. This task has been undertaken as a matter of necessity which has grown out of economic and social conditions.

The most important of these factors are, the decline of the old apprenticeship system[1] which was so successful in the small shop of the past which, within the last generation has given way to the factory; and the inability of other organized means of education to provide in an adequate measure that specific trade and vocational training demanded in the modern factory.

The apprenticeship of the gild system which served tradesmen so well in the past, but which is to the present generation in America almost unknown, had its origin in the social and industrial fabric of a time so remote that the earliest historians speak of it as a matter of course.[2]

"The craft gild or trade gilds of the Middle Ages had their origin in necessity. All sorts of industrial frauds and shoddy workmanship were practiced by the more irresponsible artisans, and the gilds were originally formed to protect their members against unskilled and dishonest labor."[3]

Apprenticeship reached its greatest success as a means of training skilled workmen in England and on the Continent during the fifteenth and the sixteenth centuries.[4]

---

[1] Ref. 31, p. 121.
[2] Refs. 10, 11, 12.
[3] Ref. 13, p. 100.
[4] Ref. 1, 3, 4.

But even at its best the gild apprenticeship system was not a complete or satisfactory solution of the industrial situation of the period. True, it did furnish to the young man who was fortunate enough to secure an apprenticeship, not only the mastery of a skilled trade but also access to the only practical education of the times, and a social standing fully equal to that of his master. Masters were required not only to teach the apprentice his trade and to furnish him good food, clothing, and shelter, but also to educate him and to give him religious instruction.[5] The English apprentice from the Fourteenth to the Sixteenth centuries became to all intents and purposes, during his apprenticeship, a member of his master's household, entitled to participate in all social activities upon a perfect equality with his master's family.

The price the apprentice paid for these privileges was not small. It included in some cases, the payment of a very considerable sum of money[6] and the giving of a bond to remain in the service of his master usually for a period of seven years without wages or other remuneration than that mentioned above. It was a big price to pay for the learning of a trade but there was no other way. Apprenticeship was the only door through which one could become a master or even a journeyman entitled to ply a skilled trade. The privileges of skilled workmen and masters were a much desired goal but the journey thereto was long, arduous and expensive.

This golden age of apprenticeship corresponds very closely to the period of cathedral building on the continent, and the high character of the craftsmanship is still attested by many of those noble structures.

The regulation of apprenticeship was usually exercised by the gilds, or craft gilds, which included all the members of any particular craft in each town or parish, and which usually ruled with an iron hand. The weavers, the dyers, the spinners, the goldsmiths, the carpenters, and the workers in practically every skilled trade were organized into craft gilds which controlled not only the work of their particular trades but the individual and social life of the members as well.

---

[5] Ref. 1, pp. 50 *et. seq.*

[6] Ref. 1, Chapter II.

As stated above, the apprenticeship system was not a complete or satisfactory solution of the industrial problem. At the very time when the system was at its best the lower strata of society,—the serfs and the unskilled laborers—were without education or training of any kind, and their suffering and degradation were almost beyond description. At the same time, the gentry as a class were densely ignorant of any useful occupations and lived in idleness, filth and vice.[7]

The stratification of society was horizontal and distinct, and the oppression and misery of the lower strata resulted partly from the upper class, the gentry, but most of all from the middle class dominated by the gilds.[8]

The decline of the golden age of the gilds and of apprenticeship dates from the middle of the Sixteenth Century, and may be attributed, in part at least, to the arrogance of the gilds and to the restrictions which they placed upon skilled labor. "Limitation of the number of apprentices and the long term of apprenticeship resulted in prejudice against the gilds and a resulting unwillingness to recognize the privileges enjoyed by the gilds."[9]

The specific events which mark the beginning of the decline of apprenticeship in England are: the passage of the Artificers Act, or the Statute of Apprenticeship, as it is called by some writers,[10] in 1562; and the law of 1601, making it compulsory upon free holders and masters to accept as apprentices such beggar children as might be designated by the parish clerk.[11]

---

[7] Ref. 14.
[8] Ref. 15, p. 3-4, and 275.
[9] Ref. 2a, pp. 91, 92.
[10] Ref. 4, p. 88.

The former of these laws provided: first, for government control of the amount of wages which might be demanded,[12] thus prohibiting the extortion frequently charged to gilds; second, a seven-year apprenticeship open only to the sons of freemen, and prohibiting any one[13] not having served an apprenticeship from carrying on any craft; and third, the appointment of government officers to enforce the regulation of the gilds. The preamble of this law states that its object was to reenact, to codify, and enforce the many regulations which had been permitted by gild influence to become inoperative.[14]

Writers disagree as to the effect of the Artificers Act upon the gilds,[15] but whether due to the operation of this act or not, the influence of the gilds waned steadily after the Sixteenth Century.

The second law, called the Act of 1601, entitled An Act for the Relief of the Poor, elevated the apprenticeship system to a position of great economic importance while it produced an almost exactly opposite effect ultimately, upon the gilds.[16] The fifth section of this law provided that, "parish authorities may bind out such poor children, male and female, as apprentices until they arrived at the age of maturity."[17] This law had the effect of continuing the institution of apprenticeship at a time when the gilds were on the decline. In fact the operation of this law had much to do with this decline. The ultimate influence upon apprenticeship, however, was unfavorable. Naturally the great increase in the number of apprentices resulting from this law had its counterpart in a deterioration of the system. Masters, no longer subject to gild regulations, neglected the education of their apprentices, and denied them the social equality of the home. No general law to compel masters to attend to the education of "parish" apprentices, aside from craft instruction, was enacted in England until 1802.[18]

---

[11] Ref. 1, p. 66.
[12] Ref. 4, p. 91.
[13] Ref. 4, p. 103.
[14] Ref. 4.
[15] Ref. 4. Chap. III.
[16] Ref. 16, Chap. VI. p. 322.
[17] Ref. 1, p. 61.

Other influences which contributed to the decline of apprenticeship were: the rise of the rural industries; the waning influence of the gilds owing to the rapid increase of skilled labor, making it impossible for the gilds to control longer the price or the conditions of labor; and later, the rise of capitalism and the factory system. This decline covers the period from the middle of the Sixteenth Century to the present time. While the number of apprentices was greatly increased as the result of the act of 1601, during the Seventeenth Century the efficiency of the apprenticeship declined rapidly from the points of view of industry and of social welfare. Since the Seventeenth Century the number of apprentices has gradually decreased, while the demand for skilled tradesmen has uniformly increased.

The industrial history of this period of decline is marked by such dark pages as child labor and the debtor's prison.[19] The larger number of apprentices and the decline of the vigilance of the gilds in governing the treatment of apprentices, made it possible for unscrupulous masters to take large numbers of apprentices, and then by economies in feeding, housing, and educating them to make their services extremely profitable. In these conditions is found the origin of the almost unbelievable evils of child labor in the Nineteenth Century in the factories of England and the United States.[20]

What has been said of apprenticeship in England and on the Continent applies in a large measure to the United

---

[18] Ref. 1, p. 61.
[19] Ref. 1, pp. 62 *et seq.*
[20] Ref. 17, pp. 14 *et seq.*

States. Trade apprenticeships, however, were never so common in the United States as in Europe, owing to the advent of the factory system before the United States had attained any great importance as a manufacturing nation. The condition of apprentices and the laws relating to them in the American colonies were generally more favorable to the apprentice than in Europe. In Massachusetts, in 1642, in Connecticut, in 1650, and in Virginia, in Queen Anne's reign, legislation provided for the instruction of apprentices in reading, in the laws of the country, and in religion, over a century before such enactments were made in England.[21]

The factory system in Europe was not an outgrowth of the introduction of steam power and labor saving machinery, but it was the direct growth of the newer apprenticeship system which developed, in part at least, as the result of the Artificers' Law and the Law of 1601.

But whatever may have been the origin of the factory system, it has, by the division of labor, and by the use of power machinery, revolutionized many of the skilled trades. Now, instead of mastering a trade and turning out a finished product, the factory worker needs but to become an expert in a single process, or in the operation of a machine which makes, not a complete product, but a minor part of it. The factory thus has a tendency to develop piece-workers rather than all-round mechanics or masters of trades, and has resulted in an almost entire discontinuance of trade apprenticeships.

In 1895, forty typical building-trades employers had 12,000 men and only eighty regular apprentices, though the normal number allowed according to union rules was 1,600.[22] The United States Census [23] in 1909-10 shows a total of 77,371 apprentices in the United States, or one for every 322 adult workers, when there was approximately 25,000,000 wage earners in occupations aside from agriculture.

---

[21] Ref. 1, p. 61.
[22] Ref. 16, p. 1142.
[23] Ref. 23a, p. 52.

The rapid development of labor saving machinery in the Nineteenth Century, and the growing complexity of manufacturing and marketing processes have created a demand for skilled workmen in almost every line of manufacture and business, far beyond the ability of any heretofore known method of apprenticeship to supply. In this condition is found the basis of the need for a new method of apprenticeship. The evolution of this new method of apprenticeship is described in the next chapter.

CHAPTER III

PUBLIC AND PRIVATE TRADE SCHOOLS, AND THE CORPORATION SCHOOL

The assumption by organized society of the responsibility of teaching any new subject has always been preceded by private enterprise assuming that responsibility,[1] from motives of either business or philanthropy. If the private project meets with success and popular approval, the burden is usually somewhat tardily assumed by the public. Hence it was, that long before public sentiment had become conscious of the duty of assuming the burden of teaching the prospective industrial worker the rudiments or the mastery of a trade or vocation, first, tradesmens' organizations and later private philanthropy had felt the need and had provided for it by establishing trade schools. Business concerns had also succumbed to the pressure of necessity and had undertaken the task of training their young workers for various positions.

No modern educational movement is destined to have a more far reaching effect upon public school practice than the corporation school movement; yet to the average American citizen as well as the average public school teacher, the corporation school is practically unknown. This lack of common knowledge of the movement is due in part to its comparative newness for the development of the corporation school has taken place almost wholly in the past ten years.

Another cause for the common lack of information about corporation schools is, that they have grown up within the walls of factories and business houses to meet a demand within these walls, and there has been no effort or desire on the part of the men back of the movement to get into the lime light or to seek publicity. The corporation school has been developed, just as any other departure which has been made for efficiency's sake, without any thought of advertising the matter to the public.

---

[1] Ref. 14, p. 282.

For these reasons it is thought wise to undertake to set forth in the present chapter the administrative organization of the typical corporation school, and to picture in some detail a few of such schools.

Notwithstanding the above purpose, it must be stated at the outset that there is no typical corporation school. The whole movement is so new, and individual schools have grown up under such diverse conditions and in obedience to such different demands that there are no two schools which have been cast in the same mold, so far as the organization of their curricula are concerned.

This uniqueness however, does not appear quite so noticeably in the organization of the administrative machinery of the corporation school, for since the National Society for the Promotion of Industrial Education has taken an active interest in the corporation school, and especially since the organization of the National Association of Corporation Schools, numerous conferences between directors of corporation schools have developed a recognition of the value of, and in many cases the adoption of what may be termed a typical administrative organization.

ADMINISTRATION

There is still a great diversity in methods of organization. In some concerns the supervision of the educational work is simply a side line for some one of the executive officers of the company; in others, it is attached to the duties of the welfare secretary; while in others, we find a regularly appointed educational secretary or director who devotes his entire time to the administration of the educational department. Some concerns have an educational advisory committee to counsel with the educational director.

Educational Director.

The chief duties of such an executive are—

(a) To organize the various curriculums and couses of study;
(b) To select the instructors for the various departments;
(c) To supervise and criticise the methods of instruction;
(d) To aid the instructors in developing text-books and lesson-sheets.
(e) To adopt a suitable system of records for students' work to show their industry, their progress and attainment.
(f) To select the students for the various courses and keep in touch with the sources of supply.
(g) To keep the higher officials of the company informed as to the needs, the efficiency, the results, and the expense of the work.
(h) To supervise the records of the department in such a manner as to show the costs of the various courses, and the various items of increased efficiency in the concern which may be attributed to the work of the department.

Such a program as this demands a man of no small calibre and his selection is a task which requires most careful consideration. Unfortunately the supply of such high-grade men is not equal to the demand and many corporations have been compelled to place their educational work in charge of men who have not had sufficient technical training in school administration to guarantee the highest efficiency.

The demand for better equipped directors, as well as for teachers of corporation schools, led the National Association of Corporation Schools at its fifth annual convention (June 1917) to initiate a movement to supply this demand, and the Association, through its executive secretary, Mr. F. C. Henderschott, in coöperation with Dr. Lee Galloway of New York University has organized a course of training in that university for the purpose of fitting men for such work.

This step cannot fail to be of inestimable value to the corporation school movement. It is comparable in possible effect, if not in scope, with the work of Horace Mann in securing the establishment of state supported normal schools for public school teachers.

Most of the men who are in charge of educational departments are graduates of technical schools and in the majority of cases they are men who have been exceptionally efficient in some executive capacity. While these qualifications are highly necessary, technical and theoretical training in school administration as viewed from the standpoint of professional educators is also an invaluable asset in such a position.

Selection of Students.

It was pointed out in the preface that the chief objection raised by the American Federation of Labor against the privately controlled vocational or industrial schools, is the fact that the students must be, or at least are, 'selected'. This selection is an essential factor in the organization of at least one type of corporation school described elsewhere in this chapter, viz., the special training school.

Just as the selection of the educational director is the most important duty of the firm management with reference to the special training courses, so the most important function of the director is the selection of students. Natural ability is the most important factor in the success of any individual, and since the whole purpose of the special training school is embodied in "higher efficiency" of the executive force of the concern expressed in longer tenure and better service, it becomes incumbent upon the educational director to select only such men as show a high degree of native ability reinforced by technical training.

Whether the selection of students should be limited to college graduates is a question upon which there is no agreement. There is no method of determining which is the most important factor in the efficiency of any student, his native ability or his college training. There is a feeling that the broader view with which college men are able to attack a new problem enables them to enter into a closer study of a business with enthusiasm and with a greater probability of mastering it. Native ability and real shop experience without theoretical and technical training are seriously handicapped, while theoretical training without native ability is useless, but there is no way of determining the constant in the equation between native ability and technical training.

The fact that there is a great shortage in the supply of candidates possessing the happy combination of both these assets makes it necessary sometimes to fill vacancies with a less desirable class of students.

The experiences of several educational directors have amply shown that it is not always safe to depend upon the recommendations of college authorities in making appointments. While no one would be inclined to question the sincerity of college executives in making recommendations, the fact that they feel under some obligations to aid their graduates to secure good places, cannot fail to prejudice them to a greater or less degree.

Many of the directors of larger schools make annual pilgrimages to the various technical schools for the purpose of getting into personal touch with available men who are about to graduate.

Teachers.

What has been said about the selection of educational directors and students applies with equal force to the selection of teachers. Instructors should have all the good qualities of both and some things besides.*

Many of the instructors who have been observed seem to have a distinctive personality to such a degree that it must have been made the basis of their selection. Many of them have been highly successful public school teachers where their success seems to have been due to their ability to 'warm up' to the boys.

METHODS OF INSTRUCTION

Some successful corporation school instructors do not quibble over the difference between teaching, training, instruction and education, nor do they waste time in evaluating the various aims of education, such as the cultural aim, the social aim or the conventional aim. Their emphasis is upon the practical aim,—upon knowledge, and not only knowledge of facts but upon knowledge of how to do.

Whether this apparent apathy toward pedagogical and psychological refinements is an unmixed good, is a question. The apparently better results obtained by some corporation schools are due, in part at least, to this emphasis upon knowledge of facts and of processes, but better results might be obtained by a greater attention to questions of modern educational usage. This is not a suggestion that an attempt be made to apply such usages with a blind attempt at uniformity. Uniformity in practice in any system is a mark, either of perfection attained or of satisfaction with a lack of perfection.

---

*A number of valuable investigations have been made during the past few years on the "qualities of merit in teachers," some of which are the following:

A Measuring Rod for Teaching Efficiency, J. H. Clement, Kansas School Magazine, Vol. 2, March, 1913.

Qualities of Merit in Teachers, Geo. D. Strayer and Wm. C. Ruediger, Journal Educ. Psych., 1910, pp. 272-279.

Qualities of Merit in Secondary Teachers, A. C. Boyce, Journal Educ. Psych., 1912, pp. 144-158.

Where uniformity is supreme, progress is always lacking. If these dogmatic statements and their implied opposites are true, there are surely many signs of progress in the multiplicity of educational methods in use in the various schools.

Without doubt, much of this variety is due to the fact that many of the schools are still in the experimental stage, and the time has not yet been sufficient to determine which is the best method, or whether there is any best method. The many kinds of business represented in the different schools naturally require different methods.

Special Methods.

In our discussion of methods, we must not lose sight of the fact that the best methods fail with poor teachers and a good teacher will secure good results by any method. The teacher is the chief factor in any educational process, and text-books and methods are of secondary importance.

Practically every commonly used method of teaching has been observed, including the study and recitation method, supervised study, the library, the laboratory, the project, correspondence, lectures, and inspection trips.

Some of these methods need no discussion here; others involve, in the corporation school, situations so unique that they demand more than passing treatment.

Laboratory Method.

A much broader meaning of the laboratory method has gradually come into use during the last decade. Now we hear of the laboratory method of teaching history, commerce, Latin, and mathematics, as well as sciences.

This wider use of the term grows naturally out of the etymology of the world, i.e., a place for work, and any method of study in which manual activity is the dominant or even an important factor, may be called the laboratory method. The teaching of business by the "actual business" plan, or by actual participation in real commercial activities, employs the laboratory method. It is the method in vogue in manual training and domestic arts work in public and private schools, and it is considered the only adequate means of mastering the technical processes of engineering. It is the shop method.

The value of this method is attested by long and continuous use. "Learning by Doing" is the slogan of the laboratory method and the applicability of it is increased by the fact that many cannot learn efficiently by any other method. This method has some decided advantages over the study and recitation method. Among these are the fact that what one actually puts into action or form is much more thoroughly ingrained into the brain fibre than what is simply read about, thus it contributes not only to manual dexterity but to mental development as well.

Much of the laboratory and shop work, performs a double function: it serves an educational end in developing a mastery of processes, and a financial end as well, since much of it is real productive commercial work. There are certain drawbacks to the laboratory methods which are serious handicap—

(a) This method is much more expensive, owing to the costly equipment, and to the materials used up or wasted by beginning students;

(b) Good shop, or laboratory teachers are much more difficult to secure than good recitation teachers, and they command relatively higher salaries;

(c) It is difficult to keep the work properly organized, for each student necessarily does individual work, and no two students will attain the same stage of advancement at the same time. This results in a practical difficulty in relating the accompanying theoretical study to the practical work.

Much of the laboratory work as conducted in corporation schools is carried on in the regular shops, where the students are assigned to tasks either for a specific length of time or until a satisfactory degree of skill is attained. The latter of these methods is doubtless the better pedagogical practice, but the necessity of system makes it more convenient in many cases to adhere to a time schedule in order to keep all the students and all the machines busy.

A combination of the study and the laboratory methods is doubtless productive of the best results. It properly correlates the practical with the theoretical, the actual with the ideal. Each one reinforces the other. As to the relative emphasis, or the relative amount of time to be given to each kind of work, it is difficult to lay down a rule applicable to any considerable number of schools.

The part time coöperative schools in which students work at their regular tasks a part of each day and attend a coöperating school the remainder of the day, present a very satisfactory combination of study and laboratory methods. Some coöperative plans provide for the pairing of the students so that each one works alternate weeks in the shop while his alternate is in school. In companies where this plan is followed school administrators are usually enthusiastic in their commendation of it.

Project Method.

The project method is simply a special phase of laboratory work. The term "The Project Method" is of comparatively recent origin. It contains, however, the essence of the best pedagogical practice, and as such, is making its way rapidly in various kinds of schools. It is almost the direct antithesis of division of labor or piece-work.

The factory method of piece-work is deadening to interest or development where the monotonous repetition of simple movements in making parts of a complete product is carried on without any interest in or knowledge about the other parts of the completed article.

This condition is the natural result of machine work and the factory system, and it is probably impossible to return to the time when there were shoemakers instead of cutters, vampers, turners, liners, and inspectors as we have them today. There are, however, many opportunities even in this day of specializing, for students to work at entire projects including all the various steps in the process from the beginning to the completed product, and where it is feasible, the project method is to be recommended. It is quite essential for those students who are to become shop foremen, or foremen of installation gangs, to become masters of entire processes including the details of every step. Thus while the project method may not be applicable to the exclusion of other methods, it should have a place wherever possible in the organization of shop and laboratory courses. The value of the Project Method as a motive to work is discussed at length in Chapter VI.

Inspection Trips.

For the purpose of giving the students a broad general view of the business of any concern, there is no adequate substitute for the observation or inspection trip.

So important is this method considered by some companies that they organize these study tours with fully as much care as the study or the laboratory courses. One very large concern, first details students to act as messengers about the plant and to the various substations and agencies in different parts of the city, for no other purpose than to familiarize the students with the geography of the plant. Later, the students are detailed as general assistants in different substations in order that they may become thoroughly familiar with the general policies and activities of the company.

In another large manufacturing plant, the students—college graduates—are required to report to different department heads on successive days and are given detailed instructions as to what they are to observe in each department. This routine, sometimes lasting for several weeks, is continued until the rounds of all the different departments are made.

In other schools instead of bunching all the inspection trips together, they are spread throughout the year, which plan is doubtless in keeping with sound pedagogy.

The entire program of excursions and observation trips is in accord with the best school practice, since it adds novelty to the daily routine and gives students a broader foundation upon which to build a thorough knowledge of the business.

In order to realize the fullest possible value from an inspection trip it must be carefully planned in advance. This plan should include the details of: where to go, what to see, what questions to ask, and what items to discuss. The danger of distractions must be foreseen and guarded against. Just as it is possible to go through the forest and not "see" a tree, so it is possible to visit a power plant and not see any of the technically essential parts of the plant.

PRESENT TYPICAL SCHOOLS

From this general survey of the organization of the methods of instruction and of the administrative machinery of the corporation school, we turn to the discussion of its present status, its geographical distribution, its aims and purposes, and the various types of schools as they exist today.

In Chapter II, it was pointed out that the gild school was the forerunner and progenitor of the modern corporation school. The most notable, because the most successful examples of craft gild schools for apprentices, are to be found in Germany.

"In Germany as in no other country, the people have been unwilling to break with the past," and a conscious effort has been made to perpetuate by legal enactments, the handicraftsman and the small tradesman, and especially the institution of apprenticeship. The effect of this legislation is shown in the statement that "30 per cent of German industry is still carried on under the handicraft system."[3]

These ends have been accomplished by enacting two quite distinct sets of laws, one affecting the small tradesman and the gilds and the other those phases of industry affected by the factory system.[4] The advantages of the apprenticeship system have been maintained by legally restoring the powers and privileges of the gilds. "Nine-tenths of the present trade schools (*Fachschulen*) are the work of the gild schools, the origin of many of which is in the Middle Ages."[5] "Of the 251 industrial schools participating in an educational exposition in Dresden, in 1898, 88 were founded by societies, 48 by the state, and 47 by private individuals."[6] While it has been the policy of most of the German states to assume the control and assist in the support of these schools,[7] many of them still retain, in a large measure, their original character.

Gild schools in France in the Middle Ages were numerous, and their industrial importance was great, but the arrogance of the gilds brought a reaction upon themselves in 1776 which greatly limited their powers, and the drastic laws of 1791 definitely abolished the gilds.

It was left for private enterprise to initiate the movement to rehabilitate French industrial training, which had been so ruthlessly destroyed by the revolution. The Duke de la Rochelle, at his own expense established a school "with a department for industrial training, which was the first institution for special trade instruction in France."[8] It was declared a national school by the First Republic in 1799. Upon this humble foundation, has been developed a thorough system of state industrial and technical schools.

---

[3] Ref. 17, and Ref. 22, p. 775.

[4] Ref. 20, pp. 7-8.

[5] Ref. 16, p. 905; Ref. 18, pp. 530, 536; Ref. 22, p. 775.

[6] Ref. 16, p. 872.

[7] Ref. 16, p. 874; Ref. 22, p. 775.

In Great Britain, the movement was somewhat later in developing, and private enterprise is credited with instituting the movement which has grown in recent years into a real interest in vocational training. This movement was initiated about 1784, by David Hale, who built at his own cost, a boarding house and school for five hundred charity children from the New Lanark cotton mills."[9]

The modern industrial technical school and technical school movement dates from 1801, in which year Dr. George Burbeck, established mechanics' classes at Anderson's University, at Glasgow; and it received a new impetus in the founding of the Mechanics' and Apprentices' Library in 1823. "The first building erected in England with accommodations for the various departments of scientific work for the dyer, the carpenter, the mason, and the machine maker, was built by private subscription for the Manchester Mechanics' Institute, in 1824."[10]

The development of trade apprenticeship schools in the United States may be said to date from the activity of the Worcester (Massachusetts) County Mechanics' Association, which was formed in 1841 for the purpose of "perfecting the mechanics' art", and which in 1866 opened a school for apprentices with 140 members the first year.[11] The New York Trade School, founded[12] by

---

[8] Ref. 16, p. 704; Ref. 21, p. 98.
[9] Ref. 18, p. 6.
[10] Ref. 18, p. 25.
[11] Ref. 19, p. 47.
[12] Ref. 16, pp. 20-22 and 987.

Col. Richard T. Auchmuty, in 1881 was also "a pioneer venture."

As to public industrial education, one authority states,[13] that up to 1870, no school of an industrial character existed except the higher institutions established as the result of the first Morrill Act, passed in 1862.

Though private industrial and technical schools, and schools fostered by trade unions, increased in number[14] these schools were quite unequal to the task of developing competent workers, fast enough to meet the growing demands of industry. Public sentiment, too, was slow in developing to a point where industrial and trade training seemed to be a public responsibility. Business concerns were therefore forced to undertake the training of their own apprentices.

This condition existed both in the United States and in Great Britain, and to a less extent in Germany, because the German State early recognized the necessity for state support of industrial and apprenticeship schools.[15]

So far as the writer has been able to ascertain, the first apprenticeship school maintained by a business corporation was established by the Chaix Printing Company of Paris, in 1863.[16] The oldest American corporation school is that founded by the R. Hoe Printing Press Company of New York in 1875.[17] Notwithstanding these few pioneer corporation schools, the movement did not attain any considerable impetus until about 1905,[18] since which time the growth in the number of such schools has been quite rapid.

A corporation school as defined for this study is a school maintained by a business concern, quite independently of outside control, for the purpose of fitting its new employees for efficient service, or for the further training of its older employees to fit them for positions of greater responsibility, as foremen, executives, or technical experts.

---

[13] Ref. 16, p. 20.

[14] Ref. 16, Chap. I.

[15] Ref. 23; Ref. 21, pp. 153-4; Ref. 21, p. 9.

[16] Ref. 16, p. 857.

[17] Ref. 16, p. 23; pp. 207-8.

[18] Ref. 16, p. 145 *et seq.*

This definition is amplified by the aims set forth by the National Association of Corporation Schools. This Association[19] is composed of over one hundred business concerns which maintain apprenticeship schools, and in addition to business concerns, a large number of individual members who are in sympathy with the movement.

The aims[20] of this association as set forth in its constitution are: "first, to develop the individual employee to his highest efficiency; second, to increase the efficiency of industry; and third, to influence courses in established educational institutions more favorably toward industry." The first two of these aims dominate, to a marked degree, all the corporation schools visited by the writer, and the literature of other schools not visited indicates that these aims are practically universal.

It is pertinent here to describe briefly the National Association of Corporation Schools whose aims are set forth above; for while this association does not include, by any means, all the business concerns which conduct apprenticeship schools, its aims and the means by which it undertakes to accomplish them are doubtless applicable to most corporation schools. The National Association of Corporation Schools was organized at New York University, January 24th, 1913,[21] where representatives from forty-eight concerns maintaining such schools had assembled in response to a general invitation issued by the New York Edison Company, and the National Cash Register Company, of Dayton, Ohio. The constitution of this Association proposes the means by which the aims stated above may be realized. Section I[22] says, "The object of the Association is to aid corporations in the education of their employees by providing a forum for the interchange of ideas, and by collecting and making available, data as to successful and unsuccessful plans in educating employees."

---

[19] Ref. 27, pp. 27-34.
[20] Ref. 27, p. 9.
[21] Ref. 31, pp. 50-54, Ref. 32.

Membership in the Association is of three classes: Class A. composed of concerns which maintain corporation schools; Class B. composed of officials of schools maintained by Class A. members; and Class C. composed of individuals who are in sympathy with the objects of the association.[23]

No sooner had the Association fairly got to work, than the great diversity of educational interests which are engaging business concerns became apparent. These various types of educational efforts are clearly shown by the enumeration of the several committees[24] to which the Association has assigned specific phases of corporation school work. This work is assigned to the following committees:

1. Special training schools,
2. Advertising, selling, and distribution schools,
3. Retail salesmanship schools,
4. Office work schools.
5. Unskilled labor,
6. Trade apprenticeship schools,
7. Public education,
8. Employment plans,
9. Safety and health,
10. Allied institutions,
11. Vocational guidance,
12. Administration and supervision.

---

[22] Ref. 31, p. 32.
[23] Ref. 31, p. 32.
[24] Ref. 27, pp. 23-25.

Each of the first six committees represents a distinct type of school whose characteristics are indicated by the name of the committee. The other committees, except the twelfth, whose function is obvious, represent the means by which the Association undertakes to realize its second and third aims; they embody the broader outlook of corporation school administrators upon the great problem of "increasing industrial efficiency" through social uplift, and through a more general solution of the problem of vocational training than is furnished by the corporation school.

We now take up the discussion of the six types of corporation schools, and reserve for the latter part of this chapter the discussion of the means of realizing the third aim of the Association. The second aim and its accomplishment, we discuss only incidentally.

1. SPECIAL TRAINING SCHOOLS

The "special training school" is a term applied to the training departments which business concerns maintain for college graduates and other technical men. "It is an organized effort to produce by training, all-round men whereas the present tendency in organization is to train specialists. Some key-note words will keep the purposes of special training schools before us.

"Breadth, round out experience.

"Make company men before you make department men.

"Know the system as a whole.

"Make men more versatile.

"Get the theory plus the practice.

"Broaden their vision."

The above quotations[26] present an approach to the ideal purpose of the special training schools, an approach which is seldom even approximated in practice.

---

[26] Ref. 19, p. 250.

The students who are enrolled in these schools usually enter directly from college and in the majority of cases they have had little or no practical business, or executive[26] work; and the purpose in such schools is to make as quickly and as economically as possible that vital contact between the theoretical work of the technical school and the practical routine of the manufacturing or commercial institution.

In attempting a classification of the special training schools, based upon printed materials secured from the various companies the writer encountered a difficult task because of the great variety of schools maintained. This diversity consists not only in the specific purposes for which the schools are maintained but also in the organization and the methods employed to accomplish those purposes.[27]

An examination of the literature of special training schools shows three dominant purposes in these schools: first, to train new employees for specific work; second, to teach a business as a whole; and third, to help employees to fit themselves for advancement. The first of these purposes provides in reality a species of apprenticeship, though the aim is a narrow specific ability instead of the mastery of an entire field or trade. The second purpose has developed because individual corporations have come to realize that an employee can be brought to his highest efficiency only by giving him a broad and intelligent view of the entire business as well as a mastery of the specific duties of his position. The third purpose applies to those employees who have shown themselves capable and worthy of promotion.

The plans of organization by which these purposes are attained are classified for the purposes of this study into five types: A, B, C, D, and E.

---

[26] Ref. 19, p. 250 *et seq.*

[27] Ref. 27, pp. 81-83.

Type A schools are distinguished by the fact that the student-employee spends all of his time in school and does no productive work. This type of school is designed to get definite results in the minimum of time by intensive study. These courses are open usually only to technical graduates and to exceptionally efficient old employees.

Type B schools differ from those of Type A not in the purpose but in the method. Under this plan, students divide their time between study and productive work, the proportion varying with different companies.

There may be one serious handicap for this latter type of school. This is due to the attitude toward these student workers of some foremen and department heads under whom students acquire their experience. The feeling on the part of these foremen that the student graduates are being trained for positions better than those they themselves hold or hope to hold, has seemed to prejudice them toward the special-training-course men to such an extent as seriously to handicap the system. At least one large concern which has been conducting such a school for several years, has recently decided either to abandon the plan or to modify it in some manner so as to overcome the difficulty. The author feels that this particular difficulty is not common as the above case is the only one which has been called to his attention as serious enough to endanger the success of the plan.

Type C schools are marked by the following characteristics:

1. The student's time is made as nearly entirely productive as possible, no time being given by the company for related instruction;
2. Students are assigned to work in various departments of the plant where they work under the same conditions as other employees;

3. There is little or no supervision aside from that given by department superintendents and foremen;
4. Students are assigned to all or at least to several departments in turn, the better to learn the whole business of the firm.

The manner of selecting the students for this type of school is the same as in Types A and B.

Type D includes the company continuation school. The continuation school is a German product, but it is gradually making its way into the educational system of the United States. The broad utilitarian aim which pervades the continuation school is expressed in the phrase "Learn while earning and earn while learning."

The purposes of the company continuation school are: first, to aid employees to equip themselves for advancement by specific training for more technical work; second, to enable employees to continue their general education; third, to increase the efficiency of employees in their present positions; and fourth, to discover for each employee the particular kind of work which he can do most efficiently.

This type of school is marked by a somewhat broader educational outlook than is present in some of the other types, as is shown by the provision that a considerable part of the student's time be given to general education instead of confining him to such work as promises greater immediate efficiency in a particular position.

In contrast with the rigid methods of selecting students in the first three types of schools, here we find no restrictions whatever. Any employee who desires to do so may enroll as a continuation student and attendance is usually voluntary, though it is required in some schools for certain classes of students.

The number of continuation schools is rapidly increasing, and the writer believes that this type of school is destined to play an increasingly important part in the solution of the problem of industrial training and efficiency.

Table II compiled by the writer in 1916 shows the names of the companies which are maintaining continuation schools, and the characteristics of their work.

Type E is the coöperative school. This type is similar to Type B, except that the study part of the school is conducted under and administered by public or private school authorities. In case of coöperation with public schools the expense of the "educational" work is usually paid out of public funds, while the company pays the employee for the time he spends on productive work. In some cases the company pays the student for the time spent in school.

TABLE II—TYPE D. COMPANY CONTINUATION SCHOOLS

Companies	Employees	Subjects*	Time
American Bridge....	any	(g) (s) bridge building	evening & (c)
Bing & Bing.......	any	(g) mechanics	evening
Chicago Telephone..	any	(s) plant maintenance	(c)
Commonwealth Edison	any	(g) (s)	day
Commonwealth Steel.	any under 22	(g)	day
Curtis Publishing...	any	(g) office and commercial work	evening
Fore River Shipbuilding	any	(g) English	evening
General Electric . ..	office	(s accounting	evening
B. F. Goodrich	any	(g) reading course	
Goodyear Tire & Rubber	foremen & inspectors		day & evening
International Harvester	boys 16-20	(g) drafting, shop practice	evening
Illinois Steel	any	(g)	
Kops Bros.	any	(g)	day
Metropolitan Life Insurance	any	(s) life insurance	(c)
	typists	(g) stenography	evening
	any	(s) actuarial work	evening

Mountain States Telephone & Telegraph	any	(g) electricity & telephone work	(c)
Newport News Shipbuilding & Dry Dock	any	(g) mechanical drawing	evening
New York Edison	any	(g) (s) technical accounting	day & evening
Norton & Norton Grinding	machinists	(s)	evening
Public Service Corporation of New Jersey	commercial	(g)	day & evening
Prudential Insurance	any	(g)	day
Cumberland Telephone & Telegraph	any	(s) telephone practice	evening
Southern Bell Telephone & Telegraph		(s) accounting	day
Simons Manufacturing	any	(g)	day
Standard Oil of New York	any	(s)	
Swift & Company	office boys	(g)	day
Tidewater Oil	clerks	(s) accounting	Sat. P. M.
Westinghouse Air Brake	office boys	(g)	day
Western Electric	any	(g)	evening
Winchester Arms	any	(g) English, mechanical drawing	evening
Yale & Towne Manufacturing	any	(g) efficiency, mechanical drawing	evening

*(g) general subjects, (s) special subjects, (c) correspondence.

In this type of school we find at work the principle of coöperation. It represents a recognition on the part of business concerns, of the applicability to their educational work, of that principle which in recent years has resulted in so many changes in the conduct of corporate business.

There are two distinct plans of coöperation: coöperation between several business concerns in the same or related fields, and coöperation between business concerns and public or private schools. Table III, based upon data collected in 1916, shows typical schools of Type E.

TABLE III.—COÖPERATIVE SPECIAL TRAINING SCHOOLS

Schools	Coöperating Companies
Company Schools.	
Central Stations Institute	Commonwealth Edison Company Federal Sign Company (Electric) Illinois Northern Utilities Company (Owning 21 subsidiary companies) Middle West Utilities Company (Comprising 140 subsidiary companies) Public Service Company of Northern Ill. (comprising five companies)
National Electric Light Assn. (Correspondence courses)	Electric light companies in all parts of the United States
Denver Gas and Electric Light Company, Gas & Electric School (Correspondence courses)	Thirty-nine companies in all parts of the United States
Public Schools.	
University of Cincinnati	Cincinnati Milling Company National Cash Register Company Western Electric Company and "Nearly 100 other firms, representing the principal phases of construction, manufacture and transportation."[28]
University of Akron	Thirty-four coöperating firms.
University of Pittsburgh	Forty-eight coöperating firms.
Georgia Institute of Technology	Seven coöperating firms.
Dayton High School	National Cash Register Company.
Cass Technical High School	Thirty-one coöperating firms, (partly trade apprenticeship courses)
Departments of commerce in sixteen large universities	National City Bank, New York.

Schools whose aim is to discover and develop selling ability are divided into two groups: one having reference to wholesaling, selling to the trade, and the selling of proprietary or patented goods either to individual customers or to the trade, and the other having reference to the development of retail salesmanship. Each of these two groups is the subject of study of a separate committee of the National Association of Corporation Schools, the former being assigned to a Committee on Advertising,

---

[28] Ref. 43, p. 16.

Selling and Distribution, and the latter to the Committee on Retail Salesmanship.

2. ADVERTISING, SELLING, AND DISTRIBUTION SCHOOLS

The scope of the work carried on in schools of this character is shown in the following outline:[29]

1. Salesmanship
    a) relation to other phases of the business,
    b) salesman's dignified work,
    c) opportunities in salesmanship,
    d) importance of selling knowledge to every business man,
    e) selling as a stepping stone to executive positions,
    f) what the salesman has an opportunity to learn,
    g) the salesmen are "born not made" fallacy refuted,
    h) the field of marketing,
    i) divisions of selling,
    j) definition of a sale,
    k) factors of a sale,
    l) the selling process,
    m) the training of salesmen.[30]

3. RETAIL SALESMANSHIP SCHOOLS

The field of retail salesmanship includes approximately one million people in the United States, a larger number than in any other one single field which is touched by corporation education activity.[31] The department stores of New York City alone employ over 28,000 sales-people.[32] So important has the training of sales-people become that there have been formed a Department Store Educational Association[32] in New York City, a Union School of Salesmanship in Boston, and numerous other agencies have taken up the study of salesmanship and the training of sales-people.

---

[29] Ref. 27, pp. 476 *et seq.*

[30] Bureau of Salesmanship Research, Carnegie Institute of Technology, Pittsburgh, Penn. See Ref. 27, p. 364, also *Printers' Ink*, April 6th, 1916.

[31] Thirteenth U. S. Census Report, 1910, Vol. IV, p. 93.

Few, if any, of the department stores have had their training work organized long enough to have any available literature outlining their curricula. Many of them, however, are pursuing at least a part of the work indicated in the following outline taken from the bulletin on the New York Department Store Educational Association:

1. Stock
    - a) classification in departments,
    - b) materials and qualities,
    - c) arrangement and care,
    - d) color, form, and style,
2. Salesmanship
    - a) types of customers,
    - b) approaching a customer,
    - c) closing the sale,
    - d) demonstration sales for discussion,
3. Commercial ethics
    - a) relation of employees to the store,
    - b) relation of employees to each other,
    - c) relation of the store to its customers,
4. System
    - a) rapid calculation,
    - b) business arithmetic,
    - c) business English.

4. OFFICE WORK SCHOOLS

Office-work schools undertake to train employees in practically all of the mechanical phases of office practice, and the extent of the work covered in different schools varies from instruction in the simplest forms of bookkeeping to a thorough training in accounting, filing, indexing, correspondence, stenography, typing, multigraphing, dictaphone operating, and general office efficiency.

---

[32] Miss Beulah Kennard, Sec. No. 49, LaFayette St., New York City.

The fact that instruction in office work varies from a minimum of practically zero to a complete training covering a year or more has made it practically impossible to classify such schools or to secure any adequate data as to their number.

5. SCHOOLS FOR UNSKILLED LABOR

The fifth phase of corporate educational activity is directed toward the unskilled laborer. This may take the form of classes in common-school subjects or, what is perhaps of greater importance, the teaching of English to foreigners.

It has been impossible to secure statistics as to the number of firms conducting such work, or as to the number of adult employees who are enrolled in school work, but some notion of the importance of this work may be gained from the fact that one firm, the American Bridge Company at Ambridge, Pennsylvania, has an enrollment of 125 adult foreigners at a single plant.[33] The Ford Motor Company reports 2,700 foreigners in the Ford English School[34] and other companies[35] report equally important work of this character. What company officials maintaining these schools think of this work is summarized in Chapter IV.

6. TRADE APPRENTICE SCHOOLS

The purpose of the trade apprentice school is to impart to each apprentice the mastery of a skilled trade.

---

[33] Ref. 27, p. 748.
[34] Ref. 86.
[35] Ref. 27, p. 197, pp. 746 *et. seq.*

These schools touch a much larger number of employees than any other type of corporation school, and are therefore doubtless the most important.

Apprentices are accepted usually at ages sixteen to twenty, and a legal indenture of apprenticeship is drawn up, which sets forth the length of the apprenticeship, the wages to be paid, and the details of the agreement. The great diversity of these agreements makes it difficult to characterize any considerable number of them. The indenture used by the Packard Motor Car Company specifies:

a) the name of the trade to be taught;
b) a deposit of twenty-five dollars to be forfeited to the company if the apprentice fails to complete his apprenticeship;
c) the conditions upon which the agreement may be legally terminated;
d) a bonus of one hundred dollars to be paid by the company upon the satisfactory completion of the apprenticeship;
e) a probationary period of one hundred hours at the end of which the applicant is either dismissed or formally accepted and a legal indenture executed between the company and the apprentice's parents or guardian;
f) a three years' term of apprenticeship of 2,700 working hours;
g) the rating of apprentices by foremen, upon a percentage basis, those receiving a high rating securing thereby a time premium which may be counted as vacation or to reduce the term of apprenticeship;
h) a wage scale of sixteen cents per hour for the first six months, and an increase of two cents per hour at the beginning of each succeeding six months;

i) a decrease in the term of apprenticeship at the option of the company in case the apprentice is a graduate of the Detroit high school.

Many companies in training their apprentices and other employees not regularly apprenticed, instead of undertaking to give them the academic and technical part of the training, enter into a coöperative agreement with public or private schools to give this training, while the practical part of the training is given in the shop under actual shop conditions. The importance of this coöperative movement and its bearing upon the solution of the problem of vocational education is discussed in Chapter X.

The reports as to the number of students in corporation schools do not give definite information as to the classification of students. In 1916, the Codification Committee of the National Association of Corporation Schools (See Advance Report of this Committee) collected statistics from forty-seven member-companies showing a total of approximately 12,000 students in all kinds of schools maintained by these member-companies. The Bulletin of the National Association of Corporation Schools—(March 17th, 1916, p. 10)—gives a total of approximately 30,000 students in corporation schools maintained by member-companies. In the opinion of the writer, the schools maintained by member-companies of the National Association of Corporation Schools number approximately half the entire number of corporation schools in the United States, so that according to this estimate there are about 60,000 students in all corporation schools in the United States.

The data collected by the writer (see Chapter IV) show that less than 1,000 of these students are college men or technically trained men, from which we conclude that a large proportion of these 60,000 workers are in the schools for retail sales-people or in the trade apprentice schools.

As stated earlier in this chapter, it is impossible to present a picture of the 'typical' corporation school, though the following description of individual schools portrays a reasonably accurate picture of those maintained by such widely different interests as railroading, printing, manufacturing, and banking.

SOUTHERN PACIFIC COMPANY SCHOOL

The apprenticeship school of the Southern Pacific Company is described by Mr. Norman Colyer* as follows:

"To my knowledge the Southern Pacific Company was the first railroad in the United States to adopt an orderly systematic scheme for the development of executive talent through the medium of apprenticeship. The idea was conceived and put into effect by Julius Kruttschnitt while vice-president and general manager of the company at San Francisco. It was first crystallized into syllabus form, under the administration of Vice-President E. E. Calvin. In 1909 it was broadened and strengthened, and January 1, 1913, by direction of President Sproule, it was extended to embrace the Traffic and Accounting as well as the Operating Departments.

"The aim of our student course is to give to young men in the employ of the Company an opportunity to pass through different departments for the purpose of gaining such coördinated knowledge of the entire railroad as will fit them better to assume positions of responsibility. It is, in fact, a laboratory course wherein the student performs the actual work of the department to which he may be assigned, supplemented by a parallel course of reading in text-books and railway publications and periodicals. Much thought has been given to the arrangement of the different periods and further changes are under consideration. Briefly, the procedure is as follows: Upon appointment, the student is first placed at a station of medium size for a term of six months. This is because the station agent handles both the beginning and the end of transportation. The student is expected to perform such duties as are assigned to him by the agent, and the agent is expected to afford him such diversified experience as will give him an all-round knowledge of station work, including ticket office, warehouse, baggage room, yard, and the solicitation of business. Being an extra man, the student is not bound down to routine, but is permitted to distribute his time in such a way as to treat each feature with equal thoroughness. Next, the student is assigned consecutively to Maintenance of Way, the office of the Superintendent of Transportation, Motive Power, Train Service, Accounting Department, and Tariff Bureau, spending three months in each. This completes his second year as a student, and he should now have a working knowledge of the several departments of the railroad and their mutual interdependence. At the student's option (subject to the approval of the management) he next elects to specialize in either Operation and Maintenance, Passenger and Freight Traffic, or Accounting. If he chooses Operation and Maintenance, his progress is as follows:

---

*Circular by Norman Colyer, S. P. R. R.

Maintenance of Way	**4**	**months**
Motive Power	**3**	**"**
Signals	**2**	**"**
Stores Department	**2**	**"**
General Manager's office	**2**	**"**
Student with Trainmaster	**5**	**"**

This completes forty-two months' service as a student, which is the length of the course. It will be seen that the operating student has gone more deeply into Maintenance, Motive Power and Transportation, and has also taken up several additional features. After his graduation he is given such special experience as is needed to fit him for a regular position; thereafter everything depends on himself.

"The student specializing in Passenger and Freight Traffic spends his last eighteen months as follows:

Passing Report Clerk at Gateway Junction Point..	3 months
Passenger Ticket Office........................	5 "
Student Solicitor in large city..................	4 "
Student District Freight and Passenger Agent....	6 "

"If he specializes in Accounting, the distribution is as follows:

Auditor Freight Accounts.......................	3 months
Auditor Passenger Accounts.....................	3 "
Division Accounting Bureau.....................	6 "
Auditor of Disbursements.......................	3 "
General	3 "

"In either case, after the final polishing off, he is put into the railroad sea and is told to swim, and he must either swim or sink.

"There is nothing spectacular about the Southern Pacific Student Course. We do not claim to make superintendents and general managers overnight. We are just trying to make all-round railroad men in a new way."

LAKESIDE PRESS APPRENTICE SCHOOL

The modern apprenticeship school originated in a printing establishment, and the printing office has always been a most fertile field for the development of such schools.

The school for apprentices of the Lakeside Press of the R. R. Donelley and Sons Company, Chicago, was established in July, 1908.*

At the Lakeside Press the boys are taken fresh from school and are taught the trade under competent instructors in one of the best equipped printing offices in the country, where the highest grade of work is produced.

The object of the school is to train competent workmen for the several departments of the establishment,—

***School for Apprentices* Lakeside Press, Chicago.

workmen who will have a thoroughly practical and theoretical knowledge of the printing business, and some of whom, by careful selection, will be able to fill responsible executive positions.

A special room is provided for the school, one part being equipped as a modern schoolroom and the other part as a model composing-room. In the school the boys are under the direction of instructors who devote their entire time to the school: the supervisor, who teaches a part of the academic work and has general oversight of the boys; the instructor, who has direct charge of the academic work and assists the supervisor; the instructor in printing, who has charge of the trade instruction in the school; and the instructor in presswork, who has charge of the apprentices in the pressrooms.

Requirements for Admission.

The requirements for admission are that a boy must be a grammar-school graduate between fourteen and fifteen years of age—the nearer fourteen the better. The boy's record must show good standing in his studies, and when deemed necessary a physical examination will be given. The boy must be of good moral character, he must be desirous of learning the printing trade, and his parents or guardian must promise to coöperate with the school in looking after his welfare. The supervisor of the school arranges to interview the applicant, who usually applies by letter, and also visits the parents. If the boy appears to be satisfactory, he is given a fair trial, and if both the boy and the supervisor of the school are satisfied, an agreement is entered into between The Lakeside Press and the boy and his parents for the term of the pre-apprenticeship course of two years.

The firm agrees to teach the boy for two years, with the provision that if he is satisfactory to the employer he shall contract for five additional years, as a full apprentice in such department as the firm deems best suited to his ability and adaptability, and the parents agree that the boy shall remain as an apprentice for a term of years until the trade is learned.

Pre-apprenticeship Term and Wages.

The course of apprenticeship is divided into two periods: first, that of pre-apprenticeship, for the first two years, during which time the boys spend half time in the school and half time in the factory; and second, that of apprenticeship, when the boys spend full time in the factory, with the exception of several hours each week when they attend school.

The students are in school three and one-half hours daily, during the pre-apprenticeship course, and are divided into two classes, graded according to their standings. They also work four and one-half hours daily in the shop, or at work connected with the factory or counting-room.

The boys receive $2.40 per week during the first year which pay is gradually increased until at the end of the third year they receive $6.00 per week. In addition to this wage, beginning with the second year, $1.00 per week is deposited by the company in a savings association which is paid to the apprentice as a bonus upon completing his apprenticeship.

The contract guarantees the boy steady employment at a regularly increased wage, and guarantees to the company the continuous services of the boy for a definite period.

The pre-apprentices spend one and three-quarters hours daily doing academic work; this time is divided into two periods, and the lessons given are in design, English, and mathematics, alternating with history and elementary science. The lessons in design are applied in the written as well as the printed work, in all the different subjects. Every exercise is a lesson in English. The rules laid down for good book work are followed in all written work. Proof marks are used in correcting all exercises, and the marks are definite and easily understood. No poor work is accepted, and as all standings for vacations and bonuses are time-basis records, the boys learn to do good work in a reasonable length of time.

The pre-apprentices spend one and three-quarters hours daily in the schoolroom, setting type, reading proof, and locking up small forms; the lessons are carefully graded, and each boy is treated as an individual, being advanced as fast as he is able to do the work. The boys are taught how to take proofs, and they learn to know that good proofs must show the type correctly placed upon proper paper of uniform size, reproducing every character in an even color, and that proofs must not be soiled. The boys also learn to recognize the compositor's ideas of good display in the proofs taken in the factory. As the standard is high, and there is a carefully estimated time on each job, the apprentices soon learn to apply themselves and do the work right at the beginning.

At the end of two years when the pre-apprenticeship course is completed, the boys, then sixteen years of age, enter the factory as regular apprentices to learn some one of the trades in the different branches of the printing business. During the pre-apprenticeship course they become acquainted with the various departments, and with this knowledge are better able to select the line of work for which they are best fitted.

Among the printing trades which are open to apprentices are: composing, linotype and monotype operating, bookbinding, presswork, feeding, pho[illegible]raving, retouching, lettering, commercial designing, illustrating, and lithographing.

The boys are under supervision during the apprentice period, and are scheduled for a definite time to each of the different lines of work in the trade selected, and are given every opportunity to learn the trade as a whole.

As far as possible, commercial work is given, making the boys realize that only good work will be accepted, and that to become efficient workmen they must center their attention upon the work in hand. The present-day industrial education is really an art education with an industrial turn, and the best guide toward an art education is producing something that everybody wants.

The academic training, begun during the pre-apprenticeship course, is continued during the apprenticeship; the boys attend school for several hours each week during the entire course and receive regular pay. The courses of instruction advance, and new subjects are added as the apprentices master the work. Much attention is given to designing: layouts for jobs are made, and when carried out in type are carefully criticized. Mechanics, industrial history, English, hygiene, and economics are given, thus training good citizens as well as producing thorough, reliable, and efficient workmen.

Reports and Standings.

A monthly report of standings is also sent to the parents, with the shop report. The method of figuring standings is explained below. A graph of the average monthly standing is also shown on the report card.

All standings are based upon the quality and the quantity of work done. Time limits are set on each job or assigned task, according to past experience. If the jobs are performed within the time limit set, and the quality of the work is up to the standard of the department, a credit of 100 is given, which means *satisfactory* work, both as to quality and quantity. The quality *must* be standard, hence the standing becomes largely a *time-basis* record. Above 100 indicates *excellent work*—standard quality in less than the time limit. Ninety-five is the bonus standard, ninety is fair, and eighty-five is failure.

High-School Graduates.

Special courses for high school graduates are maintained in the school. Each year a number of carefully selected young men, who have completed a high school course, are employed. These young men spend some time in learning how printing is produced, in order to prepare for executive positions in the offices or the factory. They are entered as high school special apprentices, and are given every opportunity to learn the business.

The length of time served depends upon the line of work selected. The young men are paid an initial salary of $8.00 a week, with regular increases, and a salary of $15.00 a week when the preliminary training is completed. The salary thereafter depends entirely upon the ability of the individual.

FORD ENGLISH SCHOOL FOR FOREIGNERS*

FORD MOTOR COMPANY

Brief History

The Ford English School was started in May 1914 with one teacher and twenty pupils. The latter part of the same month, five experienced teachers took up the work for demonstration and found the plan employed to be very successful. In September following, a call was made for volunteer teachers from the Plant. The response was so generous and the interest was so splendidly maintained that the enrollment of the English School was soon increased to 2700. The enrollment has remained about the same, as there is thus far no space to accommodate more men.

---

*See Refs. 36 & 37.

The Course.

The course consists of 72 lessons taught in 36 weeks, and in this length of time a foreigner of any nationality is taught to read, write and speak simple English.

Classes in penmanship and naturalization are also conducted under the best teachers obtainable.

The Method of Teaching.

The Cumulative Method of Dramatic English Teaching is used. This system may be defined as an adaptation of the Francis Gouin method which originated in Germany about the year 1710; but the Ford system differs from this and all other existing systems in that it furnishes instruction sheets and classroom programs for the guidance of the teacher, and also employs and emphasizes the cumulative method of dramatization.

The Teachers.

The teachers are volunteers who are willing in the spirit of "Help the Other Fellow" to give their own time without pay to the work of teaching the foreigners English. The teachers are all employees of the company and come from all parts of the Plant. These men are put into a teachers' training class which meets every week, and after twelve weeks' training they are given classes as substitute teachers. They may then teach two school periods per week, each period lasting one and one-half hours. When they prove themselves satisfactory as teachers, they are given regular classes.

Graduating Classes.

On July 25th, 1915, the first class of 115 men was graduated. The second class consisting of 519 men was graduated on February 27th, 1916; the third class consisting of 230 men was graduated on October 1, 1916. Each of these classes had a representative who made an address in English as part of the program of the graduating exercises. These classes represented over fifty nationalities. Each graduate of the school receives a diploma signed by the officers of the Company and the Educational Department certifying that he can read, write and speak English sufficiently well for all the common usages of life.

The American Club.

The American Club is an organization of the school alumni. All graduates are eligible. This Club meets twice each month to hear a program of music, a short lesson in American history or geography and to see moving pictures on educational subjects. The members are taught patriotic songs, and frequently give the school and country yells.

Americanization Day.

Historic events in which the school participated was the Americanization program of Independence Day 1915 and 1916. Two thousand Ford English School pupils and four thousand other Ford employees marched to the Detroit city hall, where they were met by the Mayor and other City Officials. Massed in front of the City Hall the men sang "America" and then proceeded to Belle Isle where they participated in the Americanization Day program. It was this event which stimulated the Board of Commerce and the Board of Education of Detroit to undertake on a large scale, the teaching of English by the Ford method in the night schools of the city. From this beginning the work has spread to other cities, and other corporations are taking up the cumulative system of dramatic English teaching, initiated at the Ford Plant.

Advanced English.

This department is maintained for any one in the Plant who wishes instruction in grammar, composition, etc. A class is also maintained in practical psychology for the benefit of those interested.

Teachers' Training Classes.

These are two in number. First, the training class already mentioned fitting men to become skilled teachers of foreigners. In this class precisely the same methods are used on the future teachers as are used in the daily classroom with foreigners.

Second, the class in public speaking. In this class all who desire it are given instruction and practice in the fundamentals and principles of public speaking.

Results.

Since the school was started in the plant accidents in the production departments have decreased 54%. A large force of interpreters were used before the school was started; now but few are necessary.

THE BANKING APPRENTICESHIP PLAN*

THE NATIONAL CITY BANK

Experience has shown that many important positions, including officerships, are filled by men who entered the Bank as boys. The Bank has, therefore, endeavored to employ only boys of the highest type—boys of real promotional possibilities. This has led the Bank to become interested in developing a closer relationship with the schools. So far the Bank's efforts in this direction have been quite successful. The college coöperative plan, inaugurated two years ago, whereby each year a number of the leading universities nominate students for membership in The College Training Class, has resulted in the training of over seventy-five men for service at home and abroad.

A further step toward a closer relationship with educational interests is now contemplated. Arrangements are being made with a number of elementary and high schools whereby every term each school will nominate not more than three boys for membership in the Banking Apprenticeship Class.

The coöperating schools must be within a distance which make it possible for the nominee to live at home while working for the Bank.

The boys nominated by the coöperating schools will be interviewed by a Bank official who has had special experience in the selection of boys. No boy should be over nineeteen years of age. Boys under sixteen years of age must be in possession of "working papers" and all must have had at least an elementary school education.

Length of Apprenticeship

The apprenticeship will cover a period of from two to four years, depending upon the age and education

---

*See *Banking Apprenticeship Plan,* by Nat. City Bank.

of the nominees, and will be subject, of course, to the Bank's right to terminate at any time, without notice and without any further obligation on its part, the apprenticeship of any boy who, in the opinion of an officer, does not show sufficient promise to warrant his continuing the course.

Selection of Nominees.

In passing upon the nominees, the Bank's custom of expressing in quantitative terms the opinions of personal qualities and the results of native ability tests will be followed.

The qualities considered are:

a. Appearance and manner.
b. Initiative and self-reliance.
c. Industry.
d. Scholarship.
e. Character.

The applicant's native intellectual ability is determined by a number of tests which seek to measure those qualities of mind which are necessary for the efficient performance of bank work. Among these qualities are:

a. The ability to handle figures.
b. Power of concentration.
c. Memory, and powers of observation.
d. Reasoning ability.
e. Accuracy.
f. Alertness and Speed.

One of the Bank's medical examiners will pass upon the applicant's physical fitness.

Training.

The training in general will be very practical. Training which is practical for the banking profession is to a large extent broadening and cultural as well. The plan comprises four distinct features:

1. **Shifting to new Departments.**
2. **Attendance upon the Training Classes.**
3. **The Regular Class Work.**
4. **The Interviews.**

Shifting to New Departments.

Apprentices will be shifted to new departments from time to time to secure as wide practice and experience as is compatible with the rendering of efficient service. Each apprentice is thus assured of an opportunity to become acquainted with the routine of a number of the more important departments. He will commence work as a page, messenger or file clerk, depending upon his age and education.

The Page Class.

Up to a year ago, when office boys and pages were employed and put to work, the Bank, like many other concerns, left their acquisition of much important information very largely to chance. The Office Practice Class, organized last year, has served in a degree to remedy this situation. But as it is important that certain information be given during the first few days that a boy is in the Bank, a Page Class has been started which among other things gives instruction in the following:

a. The Value of Courtesy.
b. Bank Geography.
c. How to Use the Telephone in The National City Bank.
d. Important Rules.
e. The Officers.
f. Important Facts About the Bank.
g. How to Handle the Tubes.
h. Simple Functions of the Departments.
i. Simple Bank Forms.
j. The Work on the Platforms.

The class meets twice weekly and in one month, or eight sessions, the material is covered. An examination is held at the end of each month, and those making a passing mark are allowed to discontinue the class. Those failing to pass must repeat the course with the new boys who have entered the Bank since the class started.

The Messenger Class.

This class is intended for young men entering the employ of the Bank as messengers, and for pages who are shortly to be promoted to the Messengers' Department. Its purpose is to describe in detail the work and duties of the messengers, mentioning every possible task or duty and explaining the proper method of handling each case. The reasons for doing things in certain ways are explained, and the underlying principles of each transaction discussed.

The Filing Class.

When a boy is to be promoted to the File Room, he is required to join the Filing Class, which is conducted on the same principle and in the same manner as the Page and Messengers' Classes. If, after one month's instruction, he cannot make satisfactory showing in the test, it is assumed that he is not fitted for this work and he is shifted to work of another nature. The class then accomplishes two important things: It provides a splendid preliminary training for every boy who will enter the Filing Department, making it possible for him to render efficient service from the start, and second, it prevents placing boys in filing work who are not fitted for that work.

The Regular Class Work.

In addition to taking from time to time the Training Courses just described, the apprentice will attend during each school year, October 1st to June 1st, the classes shown below.

All classes, with the exception of language, meet once a week. The class hours are from 8:15 to 9:00 A. M. and from 5:00 to 5:45 P. M. During the first two years, four class periods will be required each week. Thereafter the requirement will be two periods.

In addition to the special work required in the Page Class, the Filing Class, and the Messenger Class, the following courses are required: arithmetic, office practice, English, penmanship, banking and bookkeeping; while optional courses are offered in typewriting, stenography, commercial geography, economics, and advanced general reading.

The Interviews.

As the apprentice goes about his work, he will receive careful attention and supervision. Every effort will be made to direct his energies properly and to set him right when he makes mistakes.

In addition, he will be included in the Interview Plan of the Bank, which is briefly described as follows:

Three times a year each employee has an interview with an officer. Preparatory to this talk the employee is given a physical examination by the bank physician, a report on his educational activities is made out, and a Personal Report form is filled out by the department head. This Personal Report covers the following qualities:

a. Interest in the work.
b. Aptitude.
c. Reliability.
d. Accuracy.
e. Tact.
f. Speed.
g. Coöperation.
h. Address and Personality.
i. Self-confidence.
j. Initiative.
k. Courtesy.

With these three reports before him, the officer is able to talk more intelligently to the employee concerning his work and progress. He points out mistakes and weak points and commends the good features. He asks for suggestions and listens to complaints, gives advice, and in fact has a heart-to-heart talk with the employee concerning his work and his future.

Outside Courses.

A feature of the Bank's educational work that will appeal strongly to apprentices is the new plan of supplementing the Bank's classes with approved outside courses. It is felt that the Bank can best devote its time and energies to the more directly practical instruction, and that those desiring to specialize in any particular subject will profit most by enrolling in a local business school or college. Accordingly, a coöperative arrangement is being made with a number of schools which will enable our employees to take the above subjects, and such other courses as may be recommended, outside the Bank. The fees for these outside courses will be refunded by the City Bank Club upon the satisfactory completion of the work.

Opportunity to Enter Foreign Service.

One of the most important features of the Bank's educational work is the training of men for foreign service. Heretofore, the men comprising this group, known as the College Training Class, have been chosen exclusively from various universities. Hereafter apprentices who make exceptional records in bank and class work will be eligible for appointment to this class.

Selections will be based upon merit only. The factors considered are:

a. Record in Bank work.
b. Record in general class work.
c. Record in language class work.
d. Personality, and general all-round showing.

Applicants must not be under 20 nor over 23 years of age.

Physical Examinations.

Each boy must pass a physical examination before entering the Bank. Thereafter, every three months he will be given a thorough examination by one of the Bank's examining physicians. Between examinations a physician is available to render medical advice, and give treatment for ordinary ailments.

Salary.

Four year apprentices will enter the Bank on a salary of $250.00 per year. The three year boys will start on $300.00, and the two year apprentices, $350.00. A minimum increase of $50.00 per year will be made during the term of the apprenticeship, while upon the completion of the course each apprentice will be given a bonus of $100.00.

In this chapter an effort has been made to present a general survey of the corporation school; in the succeeding chapters are discussed some of the fundamental principles of organization and administration in these schools.

PART II

THE EFFICIENCY OF CORPORATION SCHOOLS

CHAPTER IV

THE EFFICIENCY OF THE CORPORATION SCHOOL AS TESTED BY BUSINESS CONCERNS WHICH MAINTAIN THEM

We now come to an examination of the corporation school in the light of the aims of such schools as set forth by the National Association of Corporation Schools. These aims are:[1] first, "to develop to the limit the efficiency of the individual employee; and second, to increase industrial efficiency in general."

In this chapter we set forth the results of our investigation of the efficiency of corporation schools as determined by such standards as have been set up by business concerns themselves.

In Chapter II reference was made to the high state of development of craftmanship under the craft-gild apprenticeship system, and the origin of the corporation school was found in the decadence of that system.

It would be highly desirable to compare the efficiency of the present system with that of the system which it has displaced but such a comparison would be manifestly misleading if not impossible. The social and industrial conditions which were dominant factors in the older system have undergone an almost complete transformation, and the present system of apprenticeship is affected by many new factors quite lacking under the old system. Among these new factors are a wide-spread general education, and the many opportunities for special technical training, a great increase in the number of trades and professions, and entirely different methods of manufacturing owing to the almost universal use of power machinery. Any conclusions, therefore, which might be based upon such a comparison would be almost valueless, not only on account of widely different conditions but also because of an almost complete lack of data for comparison.

---

[1] Chap. III.

Business concerns have assumed the responsibility for the training of their apprentices not, as a rule, from philanthropic or humanitarian motives, but for business reasons, though one of the leaders in corporation school work says that "It is a movement to introduce the human element into industry."[2] This recognition of the human element is becoming increasingly common, especially in those firms which have organized training departments. The improved conditions cited, though they may be credited largely to the training departments, are due partly to recent legislation requiring better working conditions, and the installation of safety appliances.[3]

The warrant, however, for a training department must still be found in purely business reasons which appeal to stock holders, and directors whose duty it is to produce dividends: These reasons are five in number: first, an inadequate supply of young employees to meet the demand of developing industry; second, a lack of highly skilled or technically trained men qualified for promotion; third, a demand for a higher grade of commercial products than can be produced by unskilled labor; fourth, a too frequent turn-over of labor; and fifth, a very considerable annual expense through waste of material and through accidents resulting from the carelessness or ignorance of untrained operatives.

The evidence of improvement in efficiency on these five points is of two kinds: first, the almost unanimous opinion of the officials of the firms which maintain these schools; and second, extracts from the records of a large number of these concerns.

---

[2] Ref. 34, p. 12.
[3] Ref. 33, pp. 57-58.

In the writer's correspondence with company officials and corporation school directors, the almost universal tenor is to the effect that their schools supply these deficiencies and produce these results. Personal interviews with officials and company employees reinforce this evidence.

The strongest objective evidence of the efficiency of these schools from the company's standpoint, lies in their rapid multiplication in recent years. The report of the first annual convention of the National Association of Corporation Schools[4] shows that but five corporation schools had been established before 1905, while the fourth annual report,[5] shows that this number had grown to 201 apprenticeship schools. Further evidence is in the fact that the writer has been unable to learn of the discontinuance of any of these schools except in a few cases where coöperative relations have been established with public or other educational agencies.[6] One authority[7] reports six of 112 schools discontinued, but he fails to state the reasons for their discontinuance.

In but a single case has a company official reported the apprentice school as unsatisfactory[8] and the reason for that failure was to be found in the unfavorable attitude of the older employees toward the apprentices.

The fact that the older apprenticeship schools continue to exist and that new schools are multiplying rapidly is strong evidence that they are accomplishing the purposes for which they are established.

---

[4] Ref. 31, p. 120.

[5] Ref. 27, pp. 164 *et. seq.*

[6] Ref. 18, pp. 282, 289, 294, 301.

[7] Industrial Education in Cincinnati, p. 4. Also Ref. 38, p. 199.

[8] See Chap. III. Type B.

1. *The development of trained workers*

The number of applications for apprenticeships varies with business conditions, and business conditions of the past few years have developed a great demand for workers. The evidence gained by the writer's correspondence and consultation with company officials supports the statement that the corporation school, in a great measure, meets this demand. There are approximately 60,000 student-apprentices in the corporation schools of the United States and this number constitutes a constant source of supply of trained workers.[9]

2. *The development of managerial talent*

The development of managerial talent is another aim set up by business men. Here, too, the evidence is in favor of the corporation school.[10] The Chaix Printing Company of Paris, France, which operates the oldest corporation school, reported in 1902,[11] that of the 1,200 employees of the company, including many of the foremen, 250 were graduates of the apprentice school. Mr. Norman Colyer, of the Southern Pacific Railroad Company, reports that, of 68 important promotions, 18 per cent were given to graduates of the special training course,[12] thus giving 18 per cent of the better positions to a small fraction of one per cent of the employees of the company.

The Winchester Repeating Arms Company, reports[13] that a large number of their apprenticeship graduates are now company foremen. The Pennsylvania Railroad Company school is credited with being "a most valuable selective medium for drawing men into official work."[14]

---

[9] Ref. 27, p. 325 *et seq.*

[10] Ref. 16, p. 386.

[11] Ref. 16, p. 857.

[12] See bulletin Students' Course, S. P. R. R. Co.

[13] Ref. 19, p. 192.

[14] Natl. Assn. Corp. Schools, Bulletin June, 1914.

Another report states that 65 per cent of the executives of the company come up through the apprenticeship school.

The development of foremen and company executives is one of the functions of the special training school described in Chapter III. Here a distinct type of apprentice is sought and only men who have had some technical training, and in most cases a complete technical training, are sought for these courses. Many of the companies which maintain such courses find it necessary every year to visit the universities and technical schools, in competition with other concerns, to seek the services of desirable new executive material in the graduating classes.

During the months of January and February, 1917, in reply to a questionnaire sent to all the member companies of the National Association of Corporation Schools, the writer collected data from twenty firms which maintain special training schools. The questionnaire asked, among other things, the characteristic features of the special training courses offered and the approximate number of technical men employed each year. These twenty firms reported a maximal annual demand in their training departments for a total of 887 college graduates and men with technical training or experience. These men are selected with great care and they are usually given such special training in the business of the company and in practical engineering as will fit them for important technical and managerial positions.

Some of these special training schools have been in operation for twenty-five years and the writer has not had information of the discontinuance of a single school through a failure to accomplish this end. The persistence of these schools is strong evidence that they accomplish the second end for which they are established by developing men for managerial positions.

3. *Improvement in quality of output*

The third criterion applied by business men to their apprenticeship schools is the improvement in the quality of the work done. Unfortunately, here few data are available, though all company officials report, so far as reports are available, that one of the noticeable outcomes of their training departments is the improved quality of the work. One firm reports a reduction of unit office cost per business transaction, from $1.16 to $.57 in three years, because of better trained office help, making a total saving to the company of $45,000. Another firm handled 11,247 more orders during one year, with fourteen fewer employees, all on account of greater efficiency as a result of training.[15] A representative of a large railroad company reported that through their system of training men, his company had made more progress in four years than in the preceding twenty-five years when dependence was upon other means of getting trained men.[16]

4. *Decrease in the turn-over of labor*

The fourth test applied by business concerns to corporation school efficiency relates to their effect upon the turn-over of labor.

It is not in order in this study to examine into the details of the causes which affect the tenure of employees. This has been done by other writers.[17] It is essential here to report only the bearing which corporation schools have on the question.

The manager of one large department store stated that his firm could not interest itself in the training of sales-people because of a turn of labor five times a year, and a training department would simply mean the training of people for other stores. Most company officials interviewed show a somewhat broader spirit, and where schools have been in existence long enough, the officials are almost unanimous in reporting an increase in the tenure of employees, and they credit this improvement to the corporation school.

---

[15] Ref. 19, p. 650.
[16] Ref. 19, p. 220.
[17] Ref. 19, p. 677.

This credit, however, cannot be given wholly to the training department, for many concerns, simultaneously with the installation of training departments, have installed welfare work, one of the chief functions of which is to decrease the turn-over of labor.[18]

Extracts from the reports in the hands of the writer, on the lengthened tenure of employees follow:

Mr. L. Atherton, director of apprentices at the plant of Swift and Company, reports that at the end of sixteen months the average tenure of the boys in his department has been increased from 3.5 to 8.5 months. Of 395 boys hired during three years, 192 were at the end of that time still in the employ of the company.[19]

Mr. Townley, assistant superintendent of the J. L. Hudson Department Store Company, of Detroit, reported a "very marked improvement" in the turn of labor, and he credited the improvement, in part at least, to the educational department.

The Cadillac Company, of Detroit, graduated a total of 144 apprentices from their training courses in 6 years, of whom 63 were still with the company at the end of that period, while 36 were in the automobile service of other companies.

The Denver Gas and Electric Company has since the installation of its student training course, taken on 145 men, 116 of whom—or 67 per cent—are still with the company.

The Denison Manufacturing Company reports that it costs from $50 to $75 to train a new worker, and that it has saved approximately $25,000 in 4 years by reducing the turn-over of labor from 68 per cent in 1911 to 28 per cent in 1915, through proper training and supervision of employees.[20]

---

[18] Ref. 19, p. 721.
[19] Ref. 19, p. 642.

The General Electric Company is reported as spending $831,000 in hiring and discharging annually over 22,000 employees.[21] The purpose of the training and welfare work of this company is to reduce this enormous expense.

Another company reported 2,649 college men taken into its special training course during the past 10 years and 55 per cent of those taken during the past 7 years still with the company.[22]

The Winchester Repeating Arms Company reported that about 90 per cent of the apprenticeship graduates remain permanently with the company and that several of these graduates are now foremen.[23]

The Southern Pacific Railroad Company report shows 9 graduates of their student course still in the employ of the company, with an average term of service to date, of 8 years, and 3 months.[24]

The Burroughs Adding Machine Company shows after 8 years of experience that, with 20 apprentices at all times, 25 per cent of them remain permanently with the company.[25]

The most complete statement available contains data for 1913, from 33 companies, all but 3 of which have established schools since 1905:[26]

Total number of trade apprentices	7,420
Total number of graduates	1,978
Total number still in the employ of the company where training was received	1,854
Total number in executive positions	129

---

[20] Ref. 19, pp. 667, 668.

[21] *New York Evening World*, Nov. 21, 1916.

[22] Ref. 19, p. 196.

[23] Ref. 19, p. 192.

[24] Norman Colyer, Southern Pacific R. R. Bulletin, *Training Course.*

[25] Natl. Assn. Corp. Schools, Bulletin, June, 1914.

[26] Ref. 31, p. 120.

This table shows that 93 per cent of the graduates remain with the company where their training was received.

These figures for corporation schools compare very favorably with the following report of the persistence in service of the electrical engineering graduates of Purdue University. This report covers the period from 1890 to 1915, during which time there were 1,081 graduates in electrical engineering. It shows the present occupation so far as obtainable of all these graduates.[27]

Present occupation	Number of men	Per cent of total
Manufacturing	350	32.2
Power plants	131	12
Railroad	66	6.1
Communication	67	6.2
Miscellaneous	473	43.5
	1,081	100

The Miscellaneous group is further subdivided as follows:

Present occupation	Number of men	Per cent of total
Public Service companies	25	2.3
Teaching	58	5.3
Non-electric	60	5.5
Non-engineering	100	9.2
Miscellaneous	117	10.8
Not accounted for	113	10.4
	473	100.

If we may assume that the above figures from corporation schools and from this technical school are fairly representative of the two types of schools, we are warranted in the conclusion that men trained in corporation schools show a greater tendency to persist in the kind of work for which they were trained than graduates of other technical schools.

---

[27] Ewing, D. D. *Engineering Education*, Lancaster Penna., Feb., 1917.

5. *Reduction in waste and in number of accidents*

The fifth end attained by the companies which have installed training departments is a reduction in the waste of materials and a decrease in a much more serious waste, that of human health and human life as the result of accidents.

It is not possible to credit the corporation school with all that has been accomplished in this direction, though company officials agree that the corporation school has been a very important contributor to this improvement. The fact that in many concerns the welfare work and the training work are carried on by the same department and by the same officials, makes it quite impossible to determine how much of this improvement is the result of the educational department.

Safety and health have become the slogan of a very wide-spread propaganda, even more wide-spread than the corporation-school movement. A large part of the agitation for safety and health has been crystallized into the National Safety Council, an organization of nation-wide scope which has undertaken to coördinate and unite the welfare work which is now a part of practically every modern up-to-date corporation.[28]

"Fewer accidents and longer terms of service invariably result from medical attendance, physical examinations, 'safety first' advice, sanitary lunch rooms and toilet rooms, and sanitary heat and light."[29] It requires no argument to show that whatever makes an employee more healthful, more comfortable, and more intelligent will make him a more profitable worker, will increase his term of service and will reduce his number of accidents.[30]

One of the most fruitful sources of accidents is the inability of foreigners to understand English.

---

[28] Ref. 34.
[29] Ref. 19, p. 684 and 800.
[30] Ref. 27, p. 311.

This fact is recognized by all employers of large numbers of foreigners, and the teaching of "English for Foreigners"[31] is one of the most important forms of corporation school work. This work is being fostered by:[32] the National Association of Manufacturers,[33] the National Association of Corporation Schools, the National Education Association, the North American Civic League for Immigrants,[34] the Young Men's Christian Association,[35] some from business and some from civic motives.

Typical of the latter group of interests is the work of the United States Bureau of Education in the Division of Immigrant Education.[36]

So far as information has come to the writer, the unanimous verdict of the firms conducting this work, is that it tends very strongly to reduce the number of accidents. One company reports[37] a decrease in 3 years of 64 per cent in the number of accidents attributable to the safety department and to the teaching of English to foreigners. Other companies report[38] a decrease of from 60 to 80 per cent in the number of accidents and they attribute the improvement to the same sources.

CONCLUSIONS

The data cited in this chapter and the reports from individual companies do not, by any means, exhaust the information at hand or available, bearing upon the five points in question. These data have been selected because they are typical of the large amount of evidence which has been examined. The writer believes that this evidence is sufficient to show that corporation schools accomplish the ends for which they have been organized by supplying a more nearly adequate number of trained employees, by fitting men for promotion, by reducing the turn-over of labor, by improving the output, and by decreasing the number of accidents.

---

[31] Ref. 37 .

[32] Ref. 34, pp. 515, 521, 723, 725, 747, 753; Ref. 35; Ref. 27, pp. 339-42.

[33] Headquarters No. 30 Church St., New York City.

[34] Headquarters No. 173 State Street, Boston, Mass.

[35] Ref. 2, p. 363; Ref. 36.

[36] U. S. Bureau of Education, Bulletin, Immigrant Education.

[37] Ref. 37.

[38] Ref. 36, p. 33.

One of the important items in the argument is the fact that practically no negative evidence on these points has been found.

The corporation school stands the efficiency test which business concerns apply to it. In the following four chapters are given the results of the comparison of corporation schools with public secondary schools and technical schools.

CHAPTER V

COMPARATIVE EFFICIENCY OF CORPORATION SCHOOLS AS TO INSTRUCTION

In this chapter are given the results of the comparison of the corporation school with public secondary schools and technical schools in the matter of instruction.

This study had scarcely been begun, when the writer repeatedly encountered the statement that one of the main points of superiority of corporation schools over other technical schools and public schools is a superior teaching force, and this claim, emanating both from corporation-school teachers themselves and corporation officials as well, has been kept continuously in mind as various schools of both types have been visited.

There is something about a good teacher which all recognize as the distinctive mark of his ability, yet this something is so intangible as to elude isolation. Some call it personality, some sympathy, and some intuition. While we cannot accurately define it or isolate it, every supervisor and every student readily recognizes it in the true teacher.

In addition to this essential personality, a successful corporation-school teacher should have had enough shop experience to enable him to handle any practical problem which is likely to arise. He must know more than the students do in order to hold their respect. Students expect a teacher not only to know more than they themselves, but to be a master of the subject he teaches.

In order to meet the demand for well-qualified instructors several of the larger corporations have established teacher-training courses for the purpose of giving to prospective teachers technical training, not only in class management, but also in the handling of subject-matter according to approved pedagogical principles. This movement is one of the most hopeful signs and it cannot fail to contribute to a more scientific technique of teaching. Among the organizations which are training corporation-school teachers are: the American Steel Company,[1] the American Telephone and Telegraph Company,[1] the Union School of Salesmanship, and the National Association of Corporation Schools in coöperation with the New York University.[2] This awakened consciousness on the part of corporation school administrators toward the technique of teaching suggests that a comparison of the teaching in corporation schools with the teaching in public secondary schools and technical schools may be valuable.

At the beginning of this study, copious notes were made on the teaching observed, but these were soon found to be inadequate for making a measurably accurate comparison between the two groups of schools. The better to accomplish this end a score card was needed, adapted to the scoring of engineering teaching and such other subjects as are usually taught in corporation schools.

A teacher's efficiency score card suitable for scoring the teaching in corporation schools should take into consideration those points which the efficiency engineer considers in investigating the efficiency of any business or manufacturing concern. Among these points are economy of time, economy of effort, and economy of materials. The writer has been permitted to make an adaptation of Professor Charles Hughes Johnston's Ten-Point Scale for this purpose.[3]

It was desired to have a score card which should not take into account the teacher's personality as a separate

---

[1] Ref. 27, pp. 325, 335-7.

[2] New York University Bulletin, Dept. Store Education Courses, Jan. 8, 1916.

[3] Not yet published.

TEACHERS' EFFICIENCY SCORE CARD

School........................... Lesson Topic.....................
Teacher.......................... Observer.........................
Subject...........................Date.............................
Length of Observation.............Time of day......................

	Items Scored* (Over)	Score	P	F	M	G	E
I.	TECHNIQUE OF CLASSROOM MANAGEMENT						
	1 smoothness in classroom work for whole period						
	2 mechanical skill and skillful use of devices						
	3 economy of time and effort						
	4 good physical and mental conditions						
	5 good order, industry,—avoiding distractions						
II.	RECITATION TECHNIQUE						
	1 choice of methods—lecture, laboratory, quiz, genetic, textbook, problem, project, excursion						
	2 memory drill and reviews						
	3 consideration for maturity of students						
	4 use of local and illustrative material						
III.	DEFINITENESS OF AIM						
	1 logical and pedagogical organization						
	2 elimination of irrelevant materials						
	3 clarity of aim						
	4 attainment of aim						
IV.	ASSIGNMENT OF NEXT LESSON						
	1 relating the present lesson to the next						
	2 suggestions of methods of attack and study						
	3 amount of assignment						
	4 definiteness of assignment.						
V.	PRACTICAL AND COMMON SENSE						
	1 relating theory to practice						
	2 consideration of economic and cost factors						
	3 prevalence of common sense judgments						
	4 evidence of common sense atmosphere						
VI.	MENTAL DISCIPLINE						
	1 ability to realize cause and effect						
	2 ability to make scientific inferences						
	3 ability to generalize and conceptualize						
	4 ability to think logically						
VII.	RESPONSIVENESS OF CLASS						
	1 effective and adequate response						
	2 spontaneous response						
	3 responses from entire class						
	4 group coöperation and responsibility						
VIII.	CLASS ATTITUDE TOWARD LEARNING						
	1 respect for the educative process						
	2 students blasé, bored, superficial, interested						
	3 coöperation between teacher and students						
	4 sympathetic relations of teacher and students						
IX.	BREADTH OF VIEW						
	1 use of source material						
	2 use of supplementary materials						
	3 subservience to textbook or syllabus						
	4 hospitality toward students' contributions						
X.	DEVELOPMENT OF CULTURE						
	1 good form, voice and language in classroom						
	2 appreciation of thoroughness of knowledge						
	3 refinement in manner, speech and thought						
	4 appreciation of form vs. mere knowledge						

item to be scored, not that personality[4] is an unimportant factor in any teacher's success, but it has seemed preferable so to organize the score card to be used that the scoring of the items in it, will take into account, the teacher's personality as it affects the item in question.

On the preceding page is shown the writer's adaptation of Professor Johnston's Ten-Point Scale.

The back of the Score Card is reproduced below:

TEACHERS' EFFICIENCY SCORE CARD

Explanations and directions for scoring a teacher's classroom efficiency. Read these instructions carefully.

1. The aim of this score card is to enable teachers and supervisors to coöperate intelligently in improving teaching by scoring important items in the process.

2. Use the subtopics as the basis of your judgment, but score main points only. The naming of specific subtopics need not prevent the consideration of others not named but presumably equally important.

3. Score points as they come in evidence, not necessarily in the order printed.

4. Do not score any point upon which there is insufficient evidence.

5. The observer should focus attention not upon teacher, or upon pupils in isolation but upon the entire coöperative classroom activity, and should also keep in mind the factors over which the teacher has no control, such as former classroom practice and local school and community prejudices. This suggestion applies specially to items, I, II, VII, VIII, and X.

6. The observer and the teacher should have a thorough understanding of the score card and its purpose before a class is visited, and no final judgment should be formed until at least three different scores have been made. If possible these visits should include the time when some definite larger unit of instruction is being developed. A visit should include at least half of a recitation period and should include either the beginning or the end of the period.

7. The rankings: P. F. M. G. and E. may be understood to represent approximately equal steps between the poorest teaching likely to be found and the best possible—say, roughly equivalent to rankings of 1, 3, 5, 7, 9, plus or minus on a scale of ten.

---

[4] *School Review Monograph.* No. VI.

The score card is not a grading card nor a measuring-stick or scale. The fundamental element of a scale is a series of approximately equal steps between a lower point of zero and an upper point of approximate perfection. No such claim is made for this score card, nor is it assumed that the ten items of this score card are of even approximately equal importance. They are all important, but no attempt has been made to establish a rank-order nor any weighting of the ten items.

The line drawn through the scores entered for the various items therefore cannot in any sense be considered the graph of an equation representing a relation between the various items for there are no scaled coördinates and no coördinate axes.

Each of the ten items of the score card is subdivided into sub-topics, though it is not intended that each of these sub-topics shall be scored separately; they are given simply as indicative of what the observer ought to look for, and these items are not intended to preclude the consideration of others not mentioned but pertinent and equally important.

In order to facilitate the use of the Teachers' Efficiency Score Card, and further, in order fully to acquaint any who may find occasion to use it in the scoring of teaching, with the import of the various items, the following fuller discussion of the ten items is presented:

1. TECHNIQUE OF CLASSROOM MANAGEMENT involves the more or less mechanical phases of the entire classroom procedure, including mechanical skill in the selection of, and in the adjustment and use of classroom devices, such as maps, globes, apparatus, and machinery; skill in securing economy of time and effort in making assignments, in taking the class roll, in passing to and from seats; maintaining good physical conditions as to temperature, ventilation, and humidity;

and good order, a spirit of industry, and freedom from distractions.

2. RECITATION TECHNIQUE involves: the means and methods employed in making the real vital contact between the students and the subject matter; the adaptation of the methods and materials to the maturity of the students; skill in the use of illustrative materials; and a proper emphasis upon reviews and drills.

3. DEFINITENESS OF AIM involves: consideration for proper logical and pedagogical presentation of materials; an emphasis upon essential points; the subordination of irrelevant matter so as to make the central aim of the recitation clear, and its attainment certain.

4. ASSIGNMENT OF LESSONS requires: a reasonable and a definite assignment; a proper relating of the present lesson to the next and suggestion of methods of attacking and of studying the new lesson.

5. PRACTICAL AND COMMON SENSE in a classroom is evidenced: by a due relating of theory to practice; by a due consideration for economic and cost factors wherever these factors are present; by a prevalence of common sense judgments; and by a common sense atmosphere.

6. MENTAL DISCIPLINE is evidenced in part by the ability: to realize cause and effect; to make scientific inferences; to make proper generalizations, and to form right concepts; and to think logically.

7. RESPONSIVENESS OF CLASS is evidence of good instruction, in proportion as responses are effective, adequate, spontaneous and general; and to the degree that there is present a group coöperation and a sense of group responsibility.

8. CLASS ATTITUDE TOWARD LEARNING is evidenced by the extent to which there is present a respect for the educative process; a blasè, bored, superficial, or interested attitude on the part of students; and a helpful

coöperative and sympathetic relation between teacher and pupils.

9. BREADTH OF VIEW is evidenced by the use of source and supplementary materials, by freedom from subservience to textbooks and syllabi, and by the consideration given to pupils' opinions and contributions.

10. DEVELOPMENT OF CULTURE is evidenced by the presence of good form, good voice, and language; by appreciation shown for thoroughness of knowledge; by refinement in manner, speech, and thought; and by appreciation of good form rather than knowledge.

Some of these items are in evidence in practically every classroom recitation, while others are frequently lacking. Some are easy to score, while others are rather intangible. Those relatively easy to score are Items I, II, III, IV and VII, while under the latter category fall Items V, VI, VIII, IX, and X. The importance of these more elusive outcomes will scarcely be questioned but evidence of their presence is sometimes difficult to detect. The suggestion is made in the instructions for scoring that no score be made for any item in case of insufficient evidence. It may frequently happen too, that such items as the "Assignment of Lesson", which is relatively easy to score may not be in evidence at all, owing to the fact that the assignment may have been made in advance. In such a case the proper procedure is not to score that item.

Shortly after the beginning of this study, the faculty of the Department of Civil Engineering of the University of Illinois became interested in the pedagogical phase of engineering teaching to the extent that the writer was invited to make a survey of their teaching. In compliance with this request the writer made systematic visitations to the classes of the department during the months of November and December, 1916.

This invitation afforded the desired opportunity of making a systematic comparison of the teaching of corporation schools with that of a public technical school, and hastened the completion of the Teachers' Efficiency Score Card described above.

According to Rule 6 for the use of the score card, a thorough understanding was reached with the instructors as to the purpose and the process of the scoring, and each instructor's classes, as far as possible, were visited at least three times. In order not to prejudice later scoring, as soon as a score was made, it was put aside and not referred to again until all the scoring was completed. After three scores had been made for each instructor in the department, an average score was made for each instructor by taking a mean of the three rankings in each of the ten items.

The averaging of the several scores for an instructor was done by the ordinary arithmetical process, giving the various scores, instead of the letters the arithmetical values: 1, 3, 5, 7, and 9 suggested in Rule 7, on the back of the card. In the same manner the average score on any one item for all the instructors in the department was obtained.

By treating each item in the same manner and by drawing a line through these mean scores on the various items, each instructor's average "graph" was obtained; and by a similar averaging of all ten scores for the several instructors, the department average on all the ten items was obtained.

After all the scoring was done and the average "graphs" were drawn, a report was submitted to the faculty of the department at their weekly conference and the value of the survey and the scoring was freely discussed. The writer maintained for the individual average scores, and for the department average scores, that they were diagnostic only. He did not hold that they measured on a per cent scale, the exact amount of any item, but he did maintain that each instructor's average score was a fairly accurate diagnosis of that instructor's classroom efficiency. He further maintained that the low point on the department average score—Responsiveness of Class,—was the real low point in the instruction in the department. This conclusion the writer believes agrees substantially with the combined judgment of the faculty of the department.

Thus the writer, whose knowledge of civil engineering is limited to mathematical theory, but who has given a good deal of attention to the technique of teaching and of classroom management, has been able by means of the Teachers' Efficiency Score Card, to diagnose with a fair degree of precision the instruction of the department. The usefulness and reliability of the score card has been further tested by the aid of six graduate students of the University of Illinois. These students coöperated with the writer in scoring, each quite independently, the same recitation. Five separate recitations were scored in different departments of the University of Illinois. These scores are tabulated below:

TABLE IV.

1.	Items	I	II	III	IV	V	VI	VII	VIII	IX	X
	Student A.	7	9	5	7	7	5	1	–	7	–
	Student B.	7	9	7	5	7	8	8	5	7	5
		0	0	1	1	0	1	1	–	0	–
2.	Items	I	II	III	IV	V	VI	VII	VIII	IX	X
	Student A.	8	8	8	1	8	8	5	7	5	8
	Student C.	8	7	8	1	–	9	9	9	1	7
		0	2	0	0	–	8	2	1	2	2
3.	Items	I	II	III	IV	V	VI	VII	VIII	IX	X
	Student A.	7	9	7	–	7	7	5	7	7	7
	Student B.	9	9	7	–	9	7	9	9	9	7
		1	0	0	–	1	0	2	1	1	0
4.	Items	I	II	III	IV	V	VI	VII	VIII	IX	X
	Student A.	7	7	5	8	7	5	8	7	9	–
	Student D.	5	7	5	1	5	8	7	7	7	7
		1	0	0	1	1	1	2	0	1	–

5. Items	I	II	III	IV	V	VI	VII	VIII	IX	X
Student A.	9	9	7	5	–	5	3	3	9	7
Student B.	9	9	7	5	7	5	3	3	7	5
Student E.	9	9	9	5	9	7	5	7	9	7
	0	0	1	0	1	1	1	2	1	1

In summarizing these scores "0" indicates a perfect agreement between observers on that item; "1" indicates a displacement (disagreement) of one step on the score card, the steps being 1-3-5-7-9; "2" indicates a displacement of two steps. "Displacement" may be read as the difference between the highest and the lowest score on any item.

In cases where the observer made no entry for any item, it has seemed best to take no account of that item rather than to call the blank a score of zero, which would be obviously misleading. (See Rule 4.)

In the five scores there are therefore, out of a possible fifty, in each of the following cases:

(a) 17 exact agreement of the observers,
(b) 38 displacements of one step or less, counting "0's"
(c) 7 displacements of two steps, and only
(d) 1 displacement of more than two steps.

In the case of "a", if the number of observers had been taken into account instead of the number of items, the number of exact agreements is shown to be 29, out of a possible 70, which makes an even stronger showing, the ratios being 29/70 or 41.4 per cent against 17/50 or 29.4 per cent by the former method.

The agreement of these results of the scoring of the same classroom exercise by different observers confirms the belief that the Teachers' Efficiency Score Card is a valuable aid in focusing attention upon the essential points of good classroom procedure and in scoring that procedure.

The usefulness of the score card depends largely upon two factors: first, a reasonably accurate knowledge of what is meant by the ten items of the score card; and second, a sufficient knowledge of correct classroom procedure to recognize its presence or absence as shown by these items and to judge its quality.

The judging and scoring of these items was not an easy matter. The writer usually proceeded by checking either with "+" or "—" the various sub-topics as they came into evidence to indicate either "good" or "bad" on that point; and frequently by notations in case any topic was conspicuously present or absent, or in case of other points not mentioned in the card but pertinent and important. The purpose of this procedure was to develop a general idea of the extent to which the items were in evidence. The decision as to whether any item should be scored P, F, M, G, or E was determined in the following manner: if an item was in evidence in such a manner that it represented undoubtedly very bad practice, or an evident ignorance of, or disregard for good procedure, that item has been scored either "P" or "F" according to the degree of badness; if an item was in evidence in such a manner as to show that good practice in that particular was carefully considered or habitual, that item was scored either "E" or "G" according to the degree of excellence; if the item in question was in evidence in such a manner as would likely to be most commonly observed, it was scored "M".

In pursuing this study of corporation schools the Teachers' Efficiency Score Card has been used to compare the efficiency of the instruction observed in these schools with that observed in public secondary schools and technical schools. The scoring of corporation schools and of public and private schools has necessarily not been done with such a degree of intensiveness as was possible in the civil engineering department of the University of Illinois. This is due to the fact that it has seldom been practicable to remain in any one school longer than a half day, and in but few cases has it been possible to make duplicate scores for individual instructors. There is therefore a greater probability of error in the scores of corporation school teachers than in those described above. Table V shows the scores of 18 instructors in eight different corporation schools.[1]

TABLE V.

Items		I	II	III	IV	V	VI	VII	VIII	IX	X
Teacher	1.	7	5	7	5	5	5	3	3	3	5
	2.	3	5	5	5	7	3	5	3	3	3
	3.	5	5	7	–	7	5	5	5	3	–
	4.	5	7	7	–	9	7	7	7	3	3
	5.	5	7	5	–	5	5	7	5	1	3
	6.	1	3	3	3	7	5	3	5	7	5
	7.*	3	7	6	5	3	5	4	6	6	5
	8.	7	5	7	–	3	3	7	5	1	1
	9.	5	3	3	–	5	3	1	3	3	–
	10.	3	7	7	–	5	5	5	3	3	3
	11.	5	7	7	–	5	7	–	7	3	3
	12.	5	7	5	3	7	–	3	7	3	3
	13.	7	7	7	–	7	7	5	7	5	3
	14.	7	5	7	–	7	3	7	7	3	3
	15.	7	7	7	3	5	–	7	7	–	–
	16.	3	7	5	–	5	5	5	7	3	3
	17.	5	7	5	5	5	5	3	7	3	3
	18.	3	7	7	5	5	5	7	7	7	3
Averages		5.	6.	5.9	3.8	6.	5.	5.	5.	3.5	3.3

*(average of two scores)

Table VI shows 34 scores of 21 different teachers in 7 public secondary schools and technical schools.[2] The first 23 scores are those made by 11 instructors in the Department of Civil Engineering of the University of Illinois, which are discussed above.

---

[1] Schools of the following companies: Marshall Field and Co., Packard Motor Co., R. R. Donnelly Printing Co., J. L. Hudson Department Store, Ford Motor Co., Western Electric Co., Swift and Co. and Central Stations Institute.

[2] A total of 39 scores were made but 4 of these were made in mixed and secondary classes in the Gary Schools, and one was discarded on account of extraordinary conditions under which it was made. These schools include two departments of the Engineering College of the University of Illinois; two departments of Bradley Institute at Peoria, Ill., and the High Schools at Springfield, Ill., Detroit, Mich., (Cass Tech)., and the Froebel School at Gary, Ind.

TABLE VI.

Items	I	II	III	IV	V	VI	VII	VIII	IX	X
Teacher 1.	7	5	3	7	5	5	3	3	9	7
	7	5	7	–	7	5	3	3	9	–
2.	7	7	7	–	7	5	7	7	7	7
	7	7	9	7	5	5	7	7	5	–
3.	5	7	5	7	5	5	5	5	5	5
	5	9	7	9	5	5	3	5	7	5
4.	7	7	7	7	5	5	7	7	7	5
	7	7	9	7	7	5	5	7	7	–
5.	7	7	7	–	7	5	5	7	7	7
	5	7	5	5	7	–	–	3	9	7
6.	7	7	9	–	5	5	5	7	7	7
	7	5	7	–	7	–	5	9	3	7
	7	3	3	3	5	5	5	7	3	7
7.	5	7	7	–	5	5	7	7	7	–
	5	5	7	5	5	5	5	3	5	7
	7	5	7	–	5	5	3	5	5	–
8.	3	3	7	–	7	5	1	1	7	5
9.	3	5	5	–	5	5	3	5	7	–
	7	5	7	3	7	5	3	5	5	–
10.	3	5	5	3	5	5	5	7	5	3
	3	7	9	–	7	7	5	–	5	–
11.	7	5	7	–	7	5	3	5	5	–
	9	7	9	–	7	7	7	7	5	3
C. E. Teachers' Av.	6.	6.	6.7	5.7	6.	5.+	4.6	5.5	6.1	6.–
Teacher 12.	3	7	5	3	3	3	3	3	3	3
13.	5	3	7	–	7	–	5	7	7	–
14.	9	7	5	–	7	3	3	7	–	–
15.	9	9	9	–	9	5	5	7	7	–
16.	7	5	5	–	9	5	5	9	9	–
17.	7	3	5	–	3	3	1	5	–	3
18.	7	9	9	–	7	5	5	7	–	–
18.	7	3	7	3	7	7	1	5	–	–
19.	7	3	3	–	5	3	1	5	–	3
20.	5	7	7	5	5	5	3	3	3	–
21.	5	7	–	–	5	–	7	–	7	–
Average 21 Teachers	6.1	5.9	6.6	5.3	6.	4.9	4.3	5.6	6.1	5.3
Corporations School Teachers' Averages TABLE V	5.	6.	5.9	3.3	6.	5.	5.	5.	3.5	3.3

The "graphs" of these two sets of averages are shown in Table VII. The average score of the public secondary school and technical school teachers is shown by the solid line, and that of corporation school teachers by the dotted line.

TABLE VII.
TEACHERS' EFFICIENCY SCORE CARD

Items Scored* (Over)

I. TECHNIQUE OF CLASSROOM MANAGEMENT
1. smoothness in class work for whole period
2 mechanical skill and skillful use of devices
3 economy of time and effort
4 good physical and mental conditions
5 good order, industry,—avoiding distractions

II. RECITATION TECHNIQUE
1 choice of method—lecture, laboratory, quiz, genetic, textbook, problem, project, excursion
2 memory drill and reviews
3 consideration for maturity of students
4 use of local and illustrative material

III. DEFINITENESS OF AIM
1 logical and pedagogical organization
2 elimination of irrelevant materials
3 clarity of aim
4 attainment of aim

IV. ASSIGNMENT OF NEXT LESSON
1 relating the present lesson to the next
2 suggestions of method of attack and study
3 amount of assignment
4 definiteness of assignment

V. PRACTICAL AND COMMON SENSE
1 relating theory to practice
2 consideration of economic and cost factors
3 prevalence of common sense judgments
4 evidence of common sense atmosphere

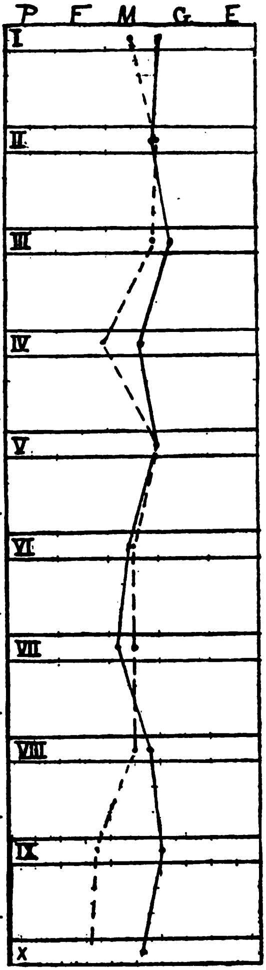
VI. MENTAL DISCIPLINE
1 ability to realize cause and effect
2 ability to make scientific inferences
3 ability to generalize and conceptualize
4 ability to think logically

VII. RESPONSIVENESS OF CLASS
1 effective and adequate response
2 spontaneous response
3 responses from entire class
4 group coöperation and responsibility

VIII. CLASS ATTITUDE TOWARD LEARNING
1 respect for the educative process
2 students blasé, bored, superficial, interested
3 coöperation between teacher and students
4 sympathetic relations of teacher and students

IX. BREADTH OF VIEW.
1 use of source materials
2 use of supplementary materials
3 subservience to textbook or syllabus
4 hospitality toward students' contributions

X. DEVELOPMENT OF CULTURE
1 good form, voice and language in classroom
2 appreciation of thoroughness of knowledge
3 refinement in manner, speech and thought
4 appreciation of form vs. mere knowledge



In order to determine whether dependence can be placed upon these averages, the probable errors have been computed by the Pearson formula.[5] In no case is the probable error more than .33 and in no case less than .20. From a statistical standpoint, therefore, the writer bases no conclusions upon these averages except such as differ by more than .66 or twice the largest probable error. This exception applies to Items I, III, IV, VII, IX, and X.

CONCLUSIONS

The evidence of Tables V and VI counting only these items, warrants the conclusion that the teaching in public secondary schools and technical schools is superior to the teaching in corporation schools in Classroom Management, Definiteness of Aim, Assignment of Lessons, Breadth of View, and Development of Culture; and that corporation school teaching is superior in Responsiveness of Class. The averages for the corporation schools are slightly larger, too, in Recitation Technique and in Mental Discipline, though the differences are too small to be statistically significant.

The conclusions derived from the scoring of the teaching observed agrees substantially with the opinion which the writer has formed while visiting these schools, except on two points. The writer believes that the teaching in public secondary schools and technical schools is superior to that in corporation schools in Recitation Technique, and that the Class Attitude Toward Learning in corporation schools is better than that in the other group of schools.

The first four points of the score card are presumably those in which professional training would function. They are the items which are emphasized in the training of teachers. In three of these four items, the teaching in public secondary schools and technical schools shows superiority over that in corporation schools. In this condition, the writer finds a further warrant for a comparison of the methods of teaching in these two groups of schools in the next chapter.

---

[5] Thorndike, E. L. *Mental and Social Measurements*, p. 188.

CHAPTER VI.

COMPARATIVE EFFICIENCY OF CORPORATION SCHOOLS AS TO MOTIVATION OF WORK

In the inanimate world there is no possibility of motion except as the result of some impelling force. In the animate world also, it is impossible to conceive of any motion or activity except as the result of some causal or motive force. In the physical world, force is defined in terms of its effect,—motion, and in the realm of the animate and the intelligent, a motive is defined as that situation which tends to produce activity. In discussing intelligent activity, the terms, motive and incentive, are usually treated as synonymous, or at least, very closely related. The selection and the application of motives in school work has given rise to a comparatively new word in pedagogical parlance, "motivation." Motivation has to do with the bringing to bear upon a pupil, such motives and incentives as will secure the desired activity, or produce an adequate reaction, and secure a proper attitude on the part of the pupil toward the work in hand.[1]

Professor John Dewey says,[2] "An educational aim must be founded upon the intrinsic activities and needs of the individual to be educated". "Education", he says, "is that reorganization of experience which adds to the meaning of experience and which increases the ability to direct the course of subsequent experience." The best experience for any individual depends upon the intrinsic activities and needs of that individual, and the motives which will best produce these intrinsic activities and supply these needs will be the best motives for that individual.

---

[1] Ref. 40, p. 126.
[2] Ref. 40, p. 89.

Return again to the figures of the physical world. The development, the conservation, and the application of power constitute the chief function of the efficiency engineer. The educational realm presents an analogous situation. The task of the teacher is the selection and right employment of incentives and motives. The needs of the pupil are important factors in determining which motives will be the most efficient in any case.

Efficiency here is used in its technical sense, as the ratio between motive power and resulting activity. As stated above, that motive will be most powerful, and therefore most effective, which grows out of the felt needs of the pupil.

Professor Dewey formulates this theory[3] into what is called the problem situation. "A problem is that situation which arouses thinking and suggests something to do with something new, to relate it properly with former experience." This "something to do" is an outcome which the pupil feels is worth while. His interest in the problem is this feeling of its worthwhileness, and this feeling of worthwhileness in a situation and its outcome is interest.[4]

Some writers measure the value of any school activity by the degree of interest which the pupil has in that activity. The fallacy here, grows out of the fact that interests originate in wants fully as frequently as in needs. Hence many interests do not contribute to the real ends of education. Their value all depends upon whether they originate in mere wants or in real needs. For example: a student may become so interested in athletics or in social pleasures as seriously to interfere with his studies and his real needs; a man may become so interested in satisfying his uncontrolled intemperate appetite as wholly to neglect his business and his family; a boy may become so interested in his play as to be quite oblivious to his duty to perform some useful task. Interest, intense interest, is unquestionably present in all these cases but interest which grows out of wants or perverted needs,—felt needs perhaps—but not real needs.

---

[3] Ref. 40, pp. 181-182.

[4] Ref. 40, p. 147; Ref. 45, 10.

Mr. H. B. Wilson says,[5] "Why not substitute for routine schoolroom practices, self imposed tasks which the pupil is vitally interested in successfully completing?"

There are several reasons why this cannot always be done: first, it is not at all certain that there is anything better to substitute; second, many of the pupils who constitute the teacher's "problem" are not vitally interested in anything that the school can indorse or sanction; third, many pupils are so transitory in their interests that they seldom, if ever, complete any task unless under compulsion; fourth, many of the self-imposed tasks are not worthwhile, so far as being contributions to the ultimate efficiency of the pupil; fifth, the great differences in the interests of pupils and the resulting great variety of "worthwhile self-imposed tasks" would so disorganize classes as to make class teaching practically impossible; and sixth, in order to develop adequate social efficiency, many real needs must be considered by the teacher which do not have in them a felt appeal to the pupil. These real needs must have attention at a time determined by the pupil's psychological development, and by social requirements, fully as much as by the pupil's feeling in the matter.

Habit formation frequently comes under this category.[6] Habits are a valuable part of one's efficiency-equipment, and many habits, in order to be effectively mastered, must be acquired during early childhood. Young children do not appreciate the importance of habits, and older ones seldom place a proper value upon them until the time for their easiest mastery has past, so that the fixing of proper habits cannot be, to any great extent, self imposed tasks, or tasks in the successful completion of which the pupil is vitally interested. The mastery of the multiplication tables, correct spelling, promptness, regularity in eating, cleanliness of person, and good manners are illustrations of important habits which usually become fixed only through the use of extraneous incentives.

---

[5] Ref. 45, p. 10.
[6] Ref. 41.

Professor Dewey[7] has set forth the value of interest as a motive to effort in school work. There is no disposition to question the validity of his argument, so far as the value of interest is concerned, but his assumption of the temporal sequence,—that effort is always subsequent to an intrinsic interest in the outcome of the situation,—is at least open to argument. Psychologists'[8] treatments of derived or secondary passive attention, point to the conclusion that interest grows out of effort quite as surely as effort out of interest. Examples are not lacking[9] to show that effort under stress of compulsion to master a certain lesson or subject results quite frequently in intense and lasting interest in that subject. In the mastery of such subjects as telegraphy, typewriting, instrumental music, and foreign languages, in which one of the essential elements is automatization of responses, there always comes a period when novelty no longer appeals, when interest lags, and progress stops. This is a critical period and unless continued effort is kept up by compulsion, either from within or without, the desired mastery is never gained and the learning process is a failure.

The "problem" situation[10] in which the pupil sees the realization of some value of vital interest to him, some satisfaction of a real felt need, is doubtless one in which the pupil will make the greatest effort, the greatest gain, and the most efficient mastery of subject matter. The teacher's task would be comparatively easy if the pupil's feeling of the worthwhileness in any situation,—his felt need,—always coincided with his real need.

---

[7] *Interest and Effort in Education.*

[8] Titchener, E. B. *Textbook of Psychology*, pp. 268 *et seq.* Angell, J. R. *Psychology*, pp. 84 *et seq.*

[9] Bagley, W. C. *School Discipline*, Chap XIV. Bryan and Harter, *Psych. Rev.* Vol. IV.

[10] Wilson, H. B. and G. M. *Motivation in School Work*, p. 10. Mann, C. R. *Teaching of Physics*, Part III. Dewey, J. *Interest and Effort in Education.*

This places upon the teacher the responsibility of pointing out or creating and developing wherever possible, the problematic situation. He must organize his work so that the pupil's time shall be employed in his efforts to realize some significant or worthy end. Only by so doing can the activity of the pupil be developed to its highest efficiency.

From the point of view of the corporation school, motivation is quite as important as in other schools. Motives will vary, according as the various aims of education are considered paramount. The aims of corporation schools are doubtless narrower than the aims of the public secondary school or technical schools, but they are more specific and the corporation school has in addition to the incentives applicable to public school work some other very specific motives.

In the opinion of the writer, teachers in other types of schools can profit by making use, as far as possible, of the motives employed in corporation schools, and on the other hand, corporation school teachers can develop a broader outlook and a higher efficiency by a theoretical as well as a working knowledge of motivation as it is employed in the best public schools.

Public secondary school teachers and technical-school teachers have at their command the following motives: promotion, grades and marks, commendation and praise, objective standards,* privileges and immunities, penalties, the "school situation," and the "problem" situation. Another group of motives not wholly distinct nor separable from these are: ideals, attitudes, and instinctive tendencies.

There are two motive situations mentioned above which merit a brief discussion. There are: the "school situation", and the "problem" situation.

1. The "school situation": In America the one public institution which more than any other is taken for granted, is the public school. From the very beginning of our national life, the atmosphere has been permeated with education. It is then no occasion for wonder that the average American child takes school life and school duties as a matter of course. Nothing is easier or more natural than to do what everybody else is doing, and so it happens that most American children need no extraneous spur, no artificial incentive. Let the average pupil be asked why he works to prepare his lessons well, why he goes to school, and the chances are that he will reply, in substance at least, that "it is the thing to do." He is not conscious of any of the other and more artificial motives which have been named. The school situation is the all sufficient motive; ideals of duty, of industry, and of right conduct are inherent in the atmosphere of the situation.

2. The problem situation: The advantages and the disadvantages of the "problem" were discussed above. While the "problem" situation or problem method does not adequately meet all the requirements for motivation in actual practice it is without doubt the most efficient and most natural stimulus, and no teacher can be

---

*A summary of the investigations on Teachers' marks and marking systems is found in the *Journal of Educational Administration and Supervision*, February '15 by Dr. H. O. Rugg. Summaries of standard tests and scales are found in the same journal October, 1916, and Publication No. 6, 1915, of the Division of Reference and Research, Department of Education, New York City.

rightly called successful who does not employ this method in situations where it is applicable. There is always present, however, the danger of going out of the way to introduce into a situation, teacher-made problems which involve only tasks, in the mastery of which the pupils, due to their immaturity, do not realize any worthwhile outcome.

The motives which have been mentioned above have an application to the work of the corporation school quite as frequently as to the work of the public schools. Corporation schools however, have the decided advantage of some motives inherent in the corporation school. These more specific motives which are available for the corporation school are:

1. the relation of employee to employer,
2. pecuniary interest,
3. the "shop situation,"
4. real problems.

1. The relation of the employee to the employer necessarily affects the work of the corporation school. Among these relations are: unquestioned and unhesitating obedience demanded and required of the employee, prompt and regular attendance at work, penalties in the form of fines or dismissal for insubordination, and the rewards of promotion for faithful service. That these relations have much to do with the attitude of students in these schools can scarcely be questioned.

2. Pecuniary interest: Apprentices and students in corporation schools usually receive wages during the entire period of their training. This fact presents a condition so different from public secondary school and technical school practices that it affects any other comparisons which may be made between the two kinds of schools. This motive has to do with the means of livelihood, with future competence, and when one can learn a trade, master a vocation or a profession, and at the same time earn

a living, he has a motive force which usually obviates the necessity for any other incentive.

3. The "shop situation." In the foregoing discussion, the "school situation" was shown to be an important factor in the motivation of school activities. What was said of the "school situation" may be said with equal applicability of the "shop situation." The very name shop is synonymous with work, industry, attention, and respect for authority; and it seems to exclude idleness, shilly-shallying and inefficiency.

It is difficult to define what is here termed the "shop situation" and the resulting "shop attitude" just as the attitude which grows out of the "school situation" eludes analysis. It is taken for granted by all concerned, employers and employees alike; and this spirit, to a very great extent, pervades the corporation school as a department of the plant, quite as noticeably as the other departments. This condition relieves the corporation school teacher of the necessity for frequent resort to artificial stimuli to effort.

In this particular, corporation schools have an enviable situation. During the writer's visitation of corporation schools, everywhere the favorable attitude of students toward the school has been in evidence. In one school in reply to the query, whether the very apparent interest of the students in their work was due to any special aptitude of the students for the particular courses they were pursuing, there was the significant statement: "It is not a matter of aptitude but of 'attitude'." The truth of this statement was attested by the replies made by several students, that they had not been conscious of any special leaning toward the kind of work that they were doing, but that they had taken the first job which had offered itself. Mr. Hultz, who is in charge of the "junior academy" of the Marshall Field and Company's store in Chicago, also says that success is not a matter of aptitude as much as attitude. "The average American boy has the ability in the proper environment to succeed in any one of a half dozen vocations."*

If then, aptitude does not account fully for this desirable attitude found in corporation schools, its source must be sought in some other direction. In the writer's opinion, this source is inherent in the three motive situations just discussed and in the real problems and projects which make up a large part of the activity of the corporation school.

4. Real problems and projects: The earlier discussions of these topics pointed out their importance as sources of interest. The greater applicability of these motives to the corporation school is due to the fact that much of the general education and practically all of the shop work has a connection with the present and future economic activities of the students. They are mastering the principles and processes of their chosen vocations and they realize that their chances for success and advancement are directly proportional to the degree of mastery attained. The shop work is usually done under conditions where the shop attitude prevails and where the requirements of the work are the rigid commercial standards of excellence of output and economy of time.

The shop attitude and the real-problem situation, however desirable and however common they may be, do not seem to have in them the elements of all sufficient motivation. Actual practice indicates that they are sometimes found lacking. In many corporation schools, pecuniary prizes for excellence of school work and bonuses for the satisfactory completion of courses are frequently given. Out of thirty-three schools reporting,[11] ten offer prizes or bonuses, another report[12] shows that eighteen out of forty-nine give prizes or bonuses, and others[13] show that this practice is quite common.

---

*Personal interviews at the R. R. Donelley Company plant, at Swift and Company's plant, and at Marshall Field & Company's store.

[11] Ref. 42, p. 75.

[12] Ref. 19, p. 145.

CONCLUSION

In the last two motives discussed, the "shop situation" and the real problem, the corporation school has an advantage over the public secondary school and over the technical school which accounts for a considerable part of the superiority (where superiority is shown) of the corporation school over the other types of schools. The utility of these two motives suggest that the solution of the problem of vocational education may be found in some form of organization which will make use of the most powerful motivating situations of both groups of schools.

---

[13] Ref. 31, chart p. 120.

Chapter VII

Comparative Efficiency of Corporation Schools as to Curricula and Courses of Study

The fourth point of view from which to compare the corporation school with public secondary schools and technical schools is in the matter of curricula and courses of study.

If all that is implied in the aim of the National Association of Corporation Schools—"to increase the efficiency of industry"—be accepted, there arises the necessity of taking into consideration other educational values besides the practical, in judging curricula and courses of study.

While the practical must dominate, especially in corporation schools, there are frequent opportunities to choose between materials which have other educational values in varying degrees. It has been pointed out that knowledge—knowledge of specific facts and specific processes—is the desired outcome in corporation schools. Efficiency as measured by increased dividends must be the ultimate end of all business activity, yet this aim need not be unmixed with higher and more humanitarian aims and other educational values.

Among these other educational values are the following:[1]

practical
intellectual
political and civic
social
ethical
religious
esthetic
conventional
cultural

These aims are largely self-explanatory and it is not in point here to elaborate upon them. The consideration of these aims contribute to a broader definition of the "highest efficiency."

---

[1] Davis, C. O. *High School Courses of Study*, Chap. III.

It is not within the scope of this study to outline curricula and courses[2] for any particular type of school. The writer points out some of the evident weaknesses of existing courses, and enumerates a few guiding principles for curriculum planning and building.

The writer has examined 46 courses and curricula from corporation schools and from public secondary schools and technical schools; and has compared them from three standpoints: first, logical and pedagogical arrangement; second, content; and third, time allotment. In making these comparisons, the writer has kept in mind the aims of corporation schools (Chapter III) which are admittedly much narrower and more specific than those usually sought in public secondary schools or technical schools.

The curricula shown in successive year-books of different corporation schools reveal the fact that some have grown simply by accretion, coral-like, without any organic connection between the old courses and the added materials. In a growing institution it is not easy to avoid this difficulty. Perhaps the only remedy is to reorganize these curricula more frequently, in order that the later courses may be properly articulated with the old ones.

This lack of proper arrangement of lesson and course topics is a natural outcome of building piece by piece, instead of planning all with a view to the interrelation among the several parts.

An illustration of this point is found in a course in mechanical drawing. In this outline, several early lessons in the course involve working drawings of machine parts, while such elementary problems as drawing parallels and perpendiculars, are deferred to a much later period in the course. This is perhaps an extreme case but other examples of a similar disregard for pedagogical and logical sequence are common.

---

[2] These terms are used as defined by a committee of the North Central Association of Colleges and Secondary Schools. (Unpublished.)

Course of Study is the work in one subject or a division of that subject running through one term or semester.

Curriculum is a group of courses related to each other, outlined for a particular group of students, and continuing through a number of terms or semesters.

Program of studies includes all the different courses and curricula offered in a school.

One of the serious faults in curricula and courses is lack of a proper time distribution. This point is illustrated in the work-shop outline for technical graduates, found in one of the circulars examined by the writer. The following classes of work were outlined:

- milling machines
- screw machine
- grinders
- tool room machines
- lathe
- gear cutting
- drill press
- foundry

The same amount of time—nine weeks—was assigned to each of these classes of work, without any apparent regard for the varying degrees of difficulty involved in the processes. Any intelligent technical graduate can be taught in a few hours to operate a drill press or a screw machine fully as well as an old operator, but possibly not so fast, and there is no logical reason for keeping a student at such work nine weeks when many of the other processes require so much more time before the student attains a mastery of them. An outline for undergraduate courses, secured from the Mechanical Engineering Department of the University of Illinois, shows the following distribution of time for these items:

milling machine	12 weeks	foundry	16 weeks
lathe	12 weeks	grinders	6 weeks
screw machine	4 weeks	drill press	4 weeks

If undergraduates can master these processes in the specified time, technical graduates ought to master a new machine for these processes in a relatively short time. This discrepancy is further emphasized by the fact that one well-known "special training" school expects technical graduates to master the operation of the screw machine in four and a half days. In another outline, tool designing is given ten weeks of shop practice, while another concern in the same business requires the mastery of this process in less than a week. Both these companies accept only technical graduates.

This criticism of time allotment does not apply with such force when students are engaged in real productive work under shop conditions and a somewhat arbitrary time distribution for the various classes of work may be necessary in order to keep all the machines and all the students busy, but it is poor pedagogical practice to keep technical graduates employed in any learning process longer than necessary to master the process.

Faulty time distribution is also frequently found in the theoretical work. This is one of the chief weaknesses of courses outlined only in loose-leaf lesson sheets. While lesson sheets have some advantages (see next chapter), they are likely to be poorly balanced as to time allotments,[3] and relatively unimportant topics are often given allotments of time equal to those given to important principles.

The examples just cited emphasize the importance of guiding principles in planning curricula and courses. These principles are summarized below:

1. Each course, each topic in a course, and each shop assignment should be allotted only such a proportion of the entire time available as will enable students to attain a reasonable degree of mastery of it.

2. Time distribution must be made with the entire curriculum in view, and hence must be the result of consultation between the instructor and the school administrator.

3. Time allotments should be made with due regard

---

[3] A valuable discussion of time distribution of interest to educational directors is found in the *Fourteenth Yearbook, Part I,* of the National Society for the Scientific Study of Education. Public School Publishing Co., Bloomington, Illinois.

to the relative educational values of the various lesson or course units.

4. A proper pedagogical or logical sequence of various lesson and course units must be observed.

Below are reproduced a number of curricula from both corporation schools and public schools, in order to illustrate some of the faults and some of the strong points in curriculum building. It will be noticed that several of the exhibits are simply outlines of single courses rather than curricula. It is, of course, quite possible to have an admirable curriculum on paper and to have a wide departure from it in practice, and the writer does not assume in the case of the curricula presented that they are carried out as printed. Some of the curricula are definite as to time allotment for the different topics while others give little or no information on this point.

CURRICULUM A.

MECHANICS' SHORT COURSE

For Automobile Mechanics to be "Packardized."
Total time three months

Pleasure car factory	**motor room**	**1 week**
	steering	**3 days**
	bridge and transmission	1 week
	chassis	**3 days**
	"K. B."	**1 week**
Truck factory	**motor**	**3 days**
	steering	**3 days**
	bridge and transmission	**1 week**
	chassis	**3 days**
	truck tuning	**1 week**
Electrical department	**wiring testing circuits**	**3 days**
	"K. B."	**3 days**
Operating department	**car inspection**	**3 days**
	truck inspection	**3 days**
	car driving test	**1 week**
	truck driving test	**1 week**

In this mechanics' short course, the time allotments are definite and the sequence of topics clearly shown, but details are lacking as to the content of the course units.

CURRICULUM B.

STUDENTS' TRAINING COURSE IN STOCK-ROOM
(Western Electric Company, Chicago.)

1st day	Friday,	Class C
2nd day	Saturday,	Tool Room
3rd day	Monday,	C. T. Sub Station Counter
4th day	Tuesday,	Hardware and Line Material
5th day	Wednesday,	Power Material
6th day	Thursday,	Sub Sets and Inter-phones
7th day	Friday,	Inter. Wires and Power Wires
8th day	Saturday,	Lamps and Batteries
9th day	Monday,	Receiving, Shipping and Cable work
10th day	Tuesday,	Shop and Clearing house
11th day	Wednesday,	Working with Stockkeeper
12th day	Thursday,	putting away stock and working
13th day	Friday,	in stock racks
14th day	Saturday,	Supply Stocks
15th day	Monday,	....
16th day	Tuesday,	Working with selectors
17th day	Wednesday,	to pick material
18th day	Thursday,	4-days on Supply Material
19th day	Friday,	1 day on Telephone Material
20th day	Saturday,	....

SUMMARY.

By this time the student shall be familiar with all the operations required on an order, from the time it is received from the customer to its shipment. He shall know the various classes of customers to whom we ship, and the kind of material each one uses. He shall study the organization of a branch house, and know the duties of each part. If questions arise which do not seem to be answered satisfactorily by the various division heads, he shall make a note of them and before the end of the term seek an interview with the stores manager, who will be glad to answer any questions.

The above course is presented as an example of detail in showing the sequence of course units and the allotments of time to the various units.

Few corporation school courses or curricula have been worked out with such detail as the above, and no public secondary school or technical school curricula approach the definiteness of this time allotment.

CURRICULUM C.

ENGINEERING CURRICULUM FOR COLLEGE GRADUATES
(Western Electric Company, Chicago)
Total time 49 weeks

Educational department ....**4 days**

General acquaintance with the Hawthorne Plant, history and organization of the company, history and development of the telephone industry, inspection trips through the shops.

Apparatus assembly department Keys, relays, drops, signals ringers, generators, coin collectors, jacks, lamps, telephones.	4 weeks
Machine department Tapping, drilling, milling, hand-screw machine, automatic screw machine, punch press, metal finishing, tool design and tool making.	2 weeks
Cable and cord departments Manufacturing of cords, switchboard cable, lead covered cable.	1 week
Switch board wiring department Wiring, testing, inspection, local cable forming, mounting apparatus, study of types of switch boards for various service requirements.	6 weeks
Factory cabling department Forming, soldering, testing, inspecting of cable for telephone offices.	2 weeks
Educational department Laboratory work on switch board circuits and exchange operation.	1 week
Engineering laboratories, New York Laboratory practice in physical and electrical measurements and transmission study.	6-12 weeks*
Installation department Installation and assembly of telephone switch board, cabling, testing, inspection.	16-20 weeks*
Engineering drafting department drafting methods, designs, practices.	0-8 weeks*

*Depending upon permanent work aimed at.

Curriculum C gives definite information as to sequence of the larger course units and the time allotted to them. The content of the curriculum is more definitely shown than in many examined.

The curricula B and C are good examples of the effect of the efficiency engineer upon all departments of an institution. Time allotment is one of the chief items in the duty of the efficiency engineer but the curricula of public secondary schools and technical schools show little evidence of the work of such an official.

CURRICULUM D.

CURRICULUM FOR BRIDGE ENGINEERS
(American Bridge Company)

First Year		
first semester:	advanced algebra	mechanical drawing
second semester:	plane geometry	structural drawing
Second Year		
first semester:	solid geometry	strength of materials
second semester:	trigonometry	elementary mechanics

Third Year		
first semester:	analytic geometry	bridge and building design
second semester:	differential calculus	bridge and building design
Fourth Year		
first semester:	Integral calculus	bridge and building design
second semester:	advanced mechanics	bridge and building design

The above curriculum does not state the number of hours per week nor the number of weeks for any course, so that time allotments cannot be criticised. The sequence of courses is subject to criticism for the separate teaching of differential and integral calculus. Many good teachers now teach them simultaneously.

CURRICULUM E.

UNION SCHOOL OF SALESMANSHIP CURRICULUM, BOSTON

Textiles	**Econmics**
Fibres—wool, silk, cotton, linen. Manufacture. Commercial geography Fabrics.	Relation of capital and wages Relation of expenditure to income The spending of money The saving of money
Color and Design	**Arithmetic**
Recognition of color tones Color combinations Appropriate use of colors Principles of design in dress and furnishing	Sale slip practice and store system Drill in addition and multiplication Fractions and percentage Cash accounts Business forms
Salesmanship	**Personal hygiene as related to business honesty**
Discussion of store experiences and the principles involved Demonstration selling and class criticisms Lectures on retail selling Care of stock Approaching a customer Individual conferences with sales girls	Hygienic dress Personal appearance Bathing Sleep and ventilation Diet The nerves

The above curriculum given no information as to arrangement of courses or time allotments. The content of the courses is not outlined in detail.

The following curriculum from the University of Illinois Register, taken in connection with the descriptions of the various courses referred to by number, is a typical technical school curriculum outline. It is definite as to the amount of time for each course, as to the content and sequence of the courses.

CURRICULUM F.

CURRICULUM IN ELECTRICAL ENGINEERING

FIRST YEAR

First Semester	Hours
Chem. 1a or 1b—Inorganic Chemistry	3 or 4
G. E. D. 1—Elements of Drafting	4
Math. 2—Algebra	3
Math. 4—Trigonometry	2
Rhet. 1—Rhetoric and Themes	3
Engineering lecture	0
Phys. Tr. 1 and 1a—Gymnasium and Hygiene	1
Mil. 2a—Military Drill	1
Total	17 or 18

Second Semester	Hours
Chem. 4—Qualitative Analysis	4
G. E. D. 2—Descriptive Geometry	4
Math. 6—Analytic Geometry	5
Rhet. 2—Rhetoric and Themes	3
Engineering Lecture	0
Phys. Tr. 2—Gymnasium	1
Mil. 1—Drill Regulations	1
Mil. 2d—Military Drill	1
Total	19

SECOND YEAR

Language	4
Math. 7—Differential Calculus	5
M. E. 75 and 77—Forge and Foundry, or M. E. 79—Pattern Work	3
Phys. 1a—Physics Lectures	3
Phys. 3a—Physics Laboratory	2
Mil. 2c—Military Drill	1
Total	18

Language	4
Math. 9—Integral Calculus	3
M. E. 75 and 77—Forge and Foundry, or M. E. 79—Pattern Work	3
Phys. 1b—Physics Lectures	2
Phys. 3b—Physics Laboratory	2
T. & A. M. 20—Analytical Mechanics.	
Mil. 2d—Military Drill	1
Total	18

THIRD YEAR

Chem. 4—Qualitative Analysis	4
E. E. 25—Direct Current Apparatus	4
E. E. 75—Electrical Engineering Laboratory	2
Math. 9a—Integral Calculus	2
Phys. 4a—Electrical and Magnetic Measurement	2
T. & A. M. 25—Resistance of Materials	4
Total	18

E. E. 26—Alternating Currents	4
E. E. 76—Electrical Engineering Laboratory	2
M. E. 2—Steam Engineering	3
Non-technical elective	3
Phys. 4b—Electrical and Magnetic Measurement	2
T. & A. M. 26—Analytical Mechanics and Hydraulics	4
Total	18

FOURTH YEAR

E. E. 35—Alternating Current Apparatus	**4**	**E. E. 36—Alternating Current Apparatus**	**4**
E. E. 55—Electrical Design	**2**	**E. E. 56—Electrical Design**	**4**
E. E. 85—Electrical Engineering Laboratory	**2**	**E. E. 86—Electrical Engineering Laboratory**	**2**
E. E. 95—Seminar	**1**	**E. E. 96—Seminar**	**1**
M. E. 11—Thermodynamics	**3**	**E. E. 98—Thesis or elective**	**3**
M. E. 61—Power Measurement	**2**	**Non-technical elective**	**3**
E. E. 99—Inspection Trip	**0**		
Non-technical elective	**3**		
Total	**17**	**Total**	**17**

CURRICULUM G.

CRANE MANUAL TRAINING HIGH SCHOOL, CHICAGO.
Scientific Course

	Courses	Weeks	Hours per week	Credits
First Year	**English**	**40**	**4**	**.8**
	Algebra	**40**	**4**	**.8**
	Physiology	**20**	**5**	**.4**
	Physiography	**20**	**5**	**.4**
	Mechanical Drawing	**40**	**4**	**.8**
	Wood-work	**40**	**8**	**.8**
	Freehand Drawing	**40**	**1**	**.2**
	Gymnasium	**40**	**1**	**.1**
	Music	**40**	**1**	**.1**
	Total			**4.4**
Second Year	**English Literature**	**40**	**4**	**.8**
	Plane Geometry	**40**	**4**	**.8**
	Zoology or Botany	**40**	**6**	**.8**
	Mechanical Drawing	**40**	**4**	**.8**
	Blacksmithing	**20**	**10**	**.4**
	Foundry and Pattern work	**20**	**10**	**.4**
	Gymnasium	**40**	**1**	**.1**
	Music	**40**	**1**	**.1**
	Total			**4.2**
Third Year	**English**	**40**	**2**	**.4**
	Solid Geometry	**20**	**4**	**.4**
	Advanced Algebra	**20**	**4**	**.4**
	Physics	**40**	**6**	**.8**
	Modern History	**40**	**4**	**.8**
	Machine Shop Practice	**40**	**6**	**.6**
	Machine or Arch. Drawing	40	4	.8
	Freehand Drawing	**40**	**2**	**.4**
	Gymnasium	**40**	**1**	**.1**
	Music	**40**	**1**	**.1**
	Total			**4.8**

Fourth Year	**American History**	**20**	**4**	**.4**
	Civil Government	**20**	**4**	**.4**
	Trigonometry	**20**	**4**	**.4**
	Engineering	**20**	**4**	**.4**
	Chemistry	**40**	**6**	**.8**
	Machine or Arch. Design	**40**	**4**	**.8**
	English	**40**	**4**	**.8**
	Freehand Drawing	**40**	**4**	**.8**
	Gymnasium	**40**	**1**	**.1**
	Electric Shop	**40**	**10**	**1.0**
	Total			**5.9**

The above is a typical secondary-school curriculum. It gives the time allotments, and the sequence of courses, but no information as to the content of the courses, and no information as to the time allotted to the larger course units.

CONCLUSION

The most obvious conclusion to be drawn from the curricula shown in this chapter, and from others which have been examined, is that a very large proportion of them do not give sufficient information to form the basis of a satisfactory comparison between the two groups of schools. So far as this information may be considered a basis for such a comparison, the writer's opinion is that the curricula and courses of study of public secondary schools and technical schools show a greater consideration for pedagogical and logical arrangement and a more thorough organization of the courses into curricula and of course units into courses; and that the courses and curricula of corporation schools show a greater specificity and a closer relation between the materials of instruction and the aims sought. The courses and curricula of public secondary schools and technical schools show a greater breadth and a greater consideration for the other educational aims and values enumerated at the beginning of this chapter.

As to time allotments no conclusion is warranted as to which type of school shows the better usage. The courses and curricula examined indicate that the question of time allotments has been more generally considered in public secondary schools and technical schools than in corporation schools, but in the few cases where corporation school administrators have applied the principles of the efficiency expert, their curricula show a much more careful working out of time allotments than has been found in any public secondary school or technical school curricula.

CHAPTER VIII

COMPARATIVE EFFICIENCY OF CORPORATION SCHOOLS AS TO TEXTBOOKS AND LESSON SHEETS

In this chapter a comparison is made between the corporation school on the one hand, and the public schools and technical schools on the other hand, in the matter of textbooks and lesson sheets. In the first part of the chapter an attempt is made to determine what standards are available for the criticism of text books and lesson sheets; in the latter part of the chapter the textbooks and lesson sheets used and offered for use in corporation schools are tested by these standards. A practical difficulty exists as to the definition of a corporation school textbook and an ordinary textbook. For this study, a corporation school textbook is one published ostensibly for use in corporation schools, though naturally no publisher would refuse to supply his books for use in any kind of school. Ordinary textbooks are also frequently used in corporation schools as well as in public schools and technical schools. There is, therefore, no well defined boundary line between the two types of books.

The writer has been able to secure but a very limited number of treatises on textbook writing.[1] One of these,[2] by Mr. J. A. Waddell, is summarized as follows: "In writing a textbook, the first step is to determine the scope and the limitations of the book, then to determine a tentative, and later a final list of chapters and the specific scope of each chapter. The proper sequence of chapters is of paramount importance, and consideration must be observed for both logical and chronological sequence. "Mr. Waddell recommends copious reference to authorities as well as a careful selection of quotations from the best technical writers on the subject being treated. Utmost care must be observed to include the latest knowledge and treatment of the most modern procedure. He also believes that textbooks merit finely polished technical English, and that this must be "first handwritten, then corrected, then typed and then corrected again." He states further, "I have never seen samples of dictated technical work which I would be willing to have attributed to my pen. . . . . In general, diagrams are better than tables, tables better than formulae and formulae better than written description . . . . Consistence in spelling, capitalization, punctuation, hyphenization, and use of symbols is a rare but most valuable attainment in textbook writing . . . . Elegance of diction is the most important attribute of any writer, next to that of producing something worthwhile, and perusal is directly proportional to good diction."

---

[1] Charters, W. W. *Methods of Teaching, Chap. XVII.* Frost, H. *Good Engineering Literature.* Chicago Book Co.

[2] Waddell, J. A. Technical Textbook Writing, *Engineering Education,* Nov. and Dec., 1916.

Mr. Waddell makes much of mechanical perfection of the manuscript, and of the final printed pages, and very properly so, for there is scarcely any fault which prejudices a reader so much against a book as errors of punctuation, spelling, and typesetting, unless it be actual errors in statement of facts, principles, or conclusions.

"The last thing to be done in connection with the writing of textbooks is the preparation of the index. The secret of good indexing is a wise selection of key-words for each topic, words which are likely to suggest themselves to seekers after information."[3] Many an otherwise excellent textbook has its value greatly reduced by lack of a good index.

---

[3] Frost, H. *Good Engineering Literature*, Chicago Book Co.

Two points of view of a good textbook are shown in the following quotations. The first is from the standpoint of the printer and asks:

"Does the volume represent the best in typography?
"Is the paper and binding suitable and durable?
"Is the presswork excellent, clear cut and easy to read?
"Does the volume as a whole appear as the work of an artist?"

The second is from the standpoint of the teacher and asks:

"Is the subject matter within the experience and reach of the intended students?
"Is the subject matter arranged with proper sequence?
"Does each section or chapter appear as a whole, or is it scrappy, containing much irrelevant matter?"

The authorities cited above, and good usage in textbook writing seem to agree upon the following "principles" which should control the writing of either textbooks or lesson-sheets:

1. Books must be truthful, at least in so far as to avoid misstatements known to be such by well informed persons. Many books show evidence of having been written by persons having little accurate practical personal knowledge of the subject treated.
2. Books must be up-to-date. Out-of-date knowledge, out-of-date processes, out-of-date facts, and out-of-date opinions have no place in progressive up-to-date textbooks or lesson sheets.
3. Correctness, clearness, simplicity, and elegance of style are "fully as important" as accuracy of statement.
4. Completeness of treatment, so far as the time allotted for the proposed course will allow, is essential.
5. Due regard must be had for a proper logical and pedagogical sequence of topics and subtopics as well as for chapter headings.
6. Illustrations or tables, in order to be justified, must give more or better information than could be given in the same space if given to reading matter.
7. Consistency and mechanical accuracy in matters of spelling, capitalization, punctuation, use of symbols, and abbreviations must be observed.
8. Mechanical excellence in matters of composition, type-setting and presswork, and in quality of paper and binding are important.
9. Textbooks must not be encyclopedic, and must be adapted to the advancement of the students for whom they are intended.

In pursuing this investigation the writer has examined thirty-one sets of lesson sheets, and over one hundred textbooks used or offered for use in corporation schools and public schools. Corporation school administrators have been quite ready to respond to requests for information in regard to books used, and they have been liberal in sending copies of their textbooks and lesson sheets.

It is impossible to state more than approximately the relative number of corporation schools which are using lesson sheets or textbooks, though judging from data collected and from personal observation, about half of them use textbooks either wholly or extensively. The following data are taken from committee reports:

Number of schools	1914	1915	1916
a) from which information was secured	35	56	27
b) using textbooks exclusively	6	5	15
c) using lesson sheets exclusively	11	15	7
d) using both textbooks and lesson sheets	18	36	5
e) "unable" to secure satisfactory textbooks			12
f) "able" to secure satisfactory textbooks			15

These data, though meager, show a slight tendency toward a more common use of textbooks and a relative decrease in the exclusive use of lesson sheets. If this is a correct estimate, and if use is any criterion of value it seems impossible to state which is better suited to corporation school needs.

1. TEXTBOOKS

The number of textbooks offered for use in corporation schools is rapidly increasing, as is shown by the extensive lists of such books given in the proceedings of the third annual convention of the National Association of Corporation Schools (pages 520-526) and in the proceedings of the fourth annual convention (pages 160--164, 627-633, and 750-752).

Without doubt many of the textbooks prepared for public school use are ill adapted to the specific requirements of the corporation school. The chairman of the Committee on Public Education, of the National Association of Corporation Schools, reported[5] that he had ex-

---

[4] Ref. 31, p. 121; Ref. 33, p. 405; Ref. 19, p. 132; Ref. 42.

[5] Ref. 27, pp. 239-40.

amined a large number of the mathematical textbooks offered by leading publishers with a view to determining the adaptability of these books to industry and that none had been found suitable. His criticism is typical of those frequently made by corporation school directors. He says, "Even a superficial examination of many of the textbooks in use would show to any group of business men that actual business conditions and requirements have not been considered by the authors. In a textbook used by my own children in the city of Detroit, bills of lumber are written in the reverse order of length, width, and thickness.

"Problems are given which are supposed to illustrate general principles of arithmetic in which the necessary additions, multiplications, subtractions and divisions are so long and complicated that an expert would hardly be able to go through them without a mistake.

"There is a widely used set of geographies which leaves about as much of an impression upon a student's mind of definite locations of places as a trip on a fast train would leave. When children get through high school they have almost no notion of place geography. The histories deal largely with the political form of government and overlook the human story of life in the early settlements. And thus you could go down the list of textbooks written for teachers by teachers and point out many things which do not fit directly into the child's life, if he should enter the industries with a preparation that we should expect of one who has completed the elementary schools."

It is true that many of the public-school textbooks have not been kept up to date, though this criticism seems to the writer to apply fully as much to those who use the textbook as to the publishers. No publisher can justly be blamed for continuing to issue a book as long as there is a market for it. The expense of writing and publishing textbooks is very high. Talent of sufficient calibre to write good books usually commands high royalties and the expense of revision of an old edition is sufficient to induce a publisher to wait as long as possible before discontinuing that edition. A representative of a well-known publisher of high-grade textbooks recently told the writer that his company frequently invests $25,000 in editorial work, plates, binding and in advertising, before a single dollar is received in return for a new book.

One of the frequent criticisms against "regular" textbooks, is that they are not adapted to the needs of corporation schools. The most common of these criticisms is that the material is too general, or not near enough up-to-date from a scientific standpoint, or that it is too impractical.

Without doubt each of these charges can be maintained in individual cases at least, yet the number of textbooks to which these criticisms do not apply is rapidly decreasing.

The following statement is from Mr. H. E. Cobb, of Lewis Institute, Chicago, himself a textbook writer and book review editor of *School Science and Mathematics.*

"The textbooks in mathematics prepared for secondary schools and colleges can not be used successfully in corporation schools, evening schools, and the like. The essential facts of mathematics, the effective way to use formulas and tables, and the methods of solving problems and checking results must be presented in a way that they can be readily grasped by the practical man who finds that he needs to use mathematics in performing his work.

"Fortunately, mathematicians of recognized ability who have given instruction in shop mathematics in University Extension courses or in mathematics courses in evening schools have felt the need and have prepared excellent textbooks for such work. Textbooks like Palmer's "*Practical Mathematics*", Norris and Smith's "*Shop Arithmetic*", and Norris and Craigo's "*Advanced Shop Mathematics*", not only furnish excellent material for instruction in practical courses, but also indicate clearly the way to make the mathematics textbooks used in secondary schools serve better the interests of most pupils."

It is not an easy matter to select the best book for any course, but there can be no reasonable excuse for using a book copyrighted in 1890, yet the writer found this book[6] in use in the school maintained by one of the foremost concerns in the country, and that, too, in the subject of arithmetic, in which there are many new books issued every year. If textbooks are approximately on a parity with teachers as educational factors, the selection of textbooks ought to receive approximately as much consideration as the selection of teachers.

No one can justly deny that textbooks prepared for public and technical school use are frequently open to the criticisms offered above, but it must not be assumed that the textbooks and lesson sheets prepared by corporation school instructors are free from these, and other criticisms.

The writer has examined twenty-seven textbooks used or offered for use in corporation schools, especially those prepared by corporation school instructors, and has found some of them very faulty, when judged by the criteria stated above, while others fully satisfy the standards which have been proposed.

Typical of the poorer class of books examined, is a mathematics textbook edited by the director of apprenticeship work in tool designing in a large automobile manufactory, which is represented by the author as a "complete practical manual of shop mathematics." There is scarcely a pedagogical principle accepted by mathematics teachers which is not violated in the book, and its mechanical make-up, both from the standpoint of English composition and that of the compositor is very poor. A single page contains fifty-seven capitalizations not warranted by good usage, and on the following page, a single mathematical term is spelled or abbreviated in four different ways, none of which has the warrant of good mathematical usage. The book abounds in mathematical statements either faulty in form or wholly incorrect from the standpoint of algebra or geometry.

---

[6] Dubb's *Arithmetical Problems*.

Many of the so-called "practical textbooks" are far superior to the one just described.

Among this better class of textbooks is the *Practical Mathematics* series in three parts, by Mr. C. I. Palmer of the Armour Institute. Part I presents the applications of arithmetic in well-selected problems illustrating both mathematical principles and their practical bearing upon real shop experience. The author finds, however, that he must use some "impractical" problems in order to reinforce certain mathematical principles which are involved in practical problems later, but which are in some of their applications too difficult for beginning students. His procedure in this regard is really an admission of the fact which has long been recognized by practical teachers that real problems taken from actual jobs seldom constitute the best problem material for the fixation of mathematical principles and processes. Part II of this series presents the applications of geometry and many of the problems are real shop problems. The author makes no claim to mathematical rigor in his explanation of geometrical principles, but his statements are clear and true so far as they go. Part III of this series is entitled "algebra." This book is open to a criticism which applies to most books on "practical" mathematics. It advances rather too rapidly in difficulty, and does not give enough problems for drill. The treatment of anti-logarithms (page 127) is faulty from a mathematical standpoint. On the whole this series of books satisfies the criteria set up for the judgment of textbooks.

Mr. J. W. L. Hale, supervisor of apprentices of the Pennsylvania Railroad Company, is the author of a series of shop-mathematics textbooks which easily pass all our criteria. "These books are the outgrowth of five years of work with shop employees", and they are organized with a due regard for, and a full knowledge of, the limitations and the requirements of these students.

Vocational Mathematics, by Mr. W. H. Dooley, explains in greater detail than most shop-mathematics textbooks, shop terms, materials, and processes. This author does not make the mistake which some make, of taking for granted that a boy knows things simply because he works in a shop.

Another book examined, *Advanced Shop Mathematics,* is a compilation of shop-mathematics sheets worked out in the extension department of the University of Wisconsin. The explanations of processes and principles are primarily intended for private study and are exceptionally full and clear.

The *Elements of Applied Mathematics,* by Mr. H. E. Cobb, of Lewis Institute, presents mathematical principles without regard to whether they come from arithmetic, algebra, geometry, or trigonometry. One good feature of this book is that in many of the problems, the students are required to secure their data by actual measurements which they make in the shops. This book readily passes the test of our criteria.

Another text, by Norris and Craigo, readily passes most of the criteria, though it is rather loose in several places from the mathematical standpoint. They say (page 17): "Two minus signs make a plus sign," and on page 25 use the word "transpose" in a manner hardly acceptable to a mathematician.

Mr. J. R. Young reports[7] that he has examined a number of mathematics textbooks used in corporation schools. He summarizes his examination as follows: "In general, the writers of texts for these schools have succeeded remarkably well in securing clear and simple statements of the fundamental principles of arithmetic, and some of the makers of more advanced texts could study their rules and definitions with profit."

The writer agrees in part with this statement, but in his opinion the majority of "corporation school textbooks" are subject to the criticism that they are too brief, increase in difficulty too rapidly, and take too much for granted in the matter of students' preparation and ability. Mr. H. E. Cobb, of Lewis Institute, says:[8] "It is no doubt true that most books of practical mathematics give so little attention to the explanation of the elementary mathematical processes that it is almost impossible for a man studying by himself to get a clear understanding of methods and processes.

The statement is frequently made that the "general" text book is not adapted to the corporation school, and this criticism is, in a measure, true. The dominant characteristic of corporation school training is its specificity, that is, its direct application to particular work for which students are preparing, and in so far as this training is for specific processes in specific occupations, the general textbook is a misfit.

In the foregoing comparisons of corporation school textbooks with the general textbook, the writer has kept in mind the "best" general textbook as determined by the criteria set up at the beginning of this chapter. These comparisons warrant the conclusion that corporation school textbooks are on the whole more specific and show a superior adaptation of lesson material to the ends desired; but that they are more commonly subject to the faults of advancing too rapidly in difficulty, and of taking too much for granted on the part of students; and that they more frequently show careless editing, poor work on the part of the compositor, and careless proof reading.

---

[7] *School Science and Mathematics*, March, 1917, p. 243.
[8] *School Science and Mathematics*, January, 1917, p. 94.

2. LESSON SHEETS

Several of the textbooks which have been examined contain in their prefatory pages, the statement that they are a compilation of lesson sheets which have been worked out in the shop school and which have stood the test of several years of service. A number of corporation school instructors have reported that their textbooks are still in the lesson sheet form. The lesson sheet is widely used in corporation schools and some corporation school instructors[9] claim that they are the only suitable lesson material. There is no logical reason why loose-leaf lesson sheets should not be a most satisfactory form of lesson material.

As in case of textbooks, among the thirty-one sets of lesson sheets examined, both extremes of quality have been found. They are not free from "impractical" or obsolete material. To illustrate this point, the following problem is quoted from a set of lesson sheets supposed to be based upon shop experience. "Four locomotives consume respectively, 390 lbs, 543 lbs, 621 lbs, and 464 lbs of coal per hour. How much coal will they all use in an hour? How much will they consume running night and day for a week?" This is not even a possible "practical" problem. The number of such illustrations might be multiplied almost without limit, emphasizing the fact that the making of lesson sheets is not an amateur's job.

Several lesson sheets which have been examined, which undertake to present the subject of business psychology, would not pass muster with any modern psychologist. In no field of applied science has there been a greater reversal or abandonment of former theories and practices than in the field of educational psychology. The old faculty theory of mind has been abandoned by practically all modern psychologists, together with the theories of training these "faculties." In view of this situation, the following construct of the human mind quoted from the lesson sheets on business psychology issued by the Telephone Society of the Mountain States is in point:

---

[9] Ref. 19, p. 200 *et seq.*

> "It may be said that there are eight attributes of mind which follow each other in a certain sequence: attention, interest, concentration, comprehension, decision, will, reason, memory. All persons think, but all do not think rightly. To think rightly, the mind must be trained, so that the eight attributes will follow each other in proper sequence, thus progressing toward the conclusion by successive steps. When a subject first comes to our notice, we give it attention; if it is attractive we become interested; if it seems to be important we concentrate our thoughts upon it until we comprehend its purpose; then we make a decision as to whether or not it is of sufficient importance to warrant further consideration. If it does not seem to be of sufficient importance, we think no more about it, but if we decide that further consideration of it will result in fulfilling our requirements along certain lines we exert our will constantly to the study of the subject, and thus through a process of reasoning, we store the knowledge in our memory which finally results in the building up of an education."

Another lesson sheet says: "We live in habit. Good habits are as easily formed as bad ones . . . ." These quotations which are typical of the psychological theory contained in many lesson sheets and textbooks on the psychology of business indicate a lack both of broad scholarship and care in their preparation.

Another fault of loose-leaf lesson sheets is the disregard they seem to exhibit for logical sequence of course topics. This point is illustrated in a set of lesson sheets on mechanical drawing in which the early lessons are simple working drawings of machine parts, while the fundamental problems of drawing perpendiculars, parallels and bisectors are found much later in the course.

Still another serious fault in lesson sheets grows out of the fact that they are easily replaced, and are designed for temporary, rather than for permanent use.

This fault is evident in careless editing, poor printing, poor paper and poor proof-reading which frequently injures an otherwise good set of lesson sheets. Mr. Young[10] says of the arithmetic used in the Santa Fe Railway System's apprenticeship school: "There is little organization to the problems that points to any special method of approach, ... and it was printed without consideration for the eyes of the apprentice. The print is exceedingly small." The writer's examination of this set of lessons confirms the above comment.

These faults are, of course, not inherent in lesson sheets. The fact that they are used so commonly, and with such satisfactory results to corporation school directors[11] indicates that they merit the tribute paid to them by a well-known publisher of commercial text-books. He says: "We are indebted to corporation schools, for they are 'road makers' in the way of textbooks. We have adopted into our texts for public and private schools many of the ideas of the lesson sheets worked out in the laboratories of these schools." Many lesson sheets show a thorough mastery of the subject treated, great care in the preparation of lesson material, and an admirable adaptation to the purpose or aim of the course in question.

Among this class of lesson sheets are those used by the Western Electric Company in mechanical drawing, in practical mathematics, and in business English; by the International Harvester Company, in shop mathematics and mechanical drawing, and by Swift and Company in practical arithmetic. The lesson sheets prepared by H. G. Petermann for the training of clerks and salesmen for the United Cigar Stores Company are an example of the specificity of the lesson material contained in good lesson sheets. These lesson sheets undertake to equip cigar store salesmen with an accurate knowledge of what to do and what to say in any situation which may arise. Marshall Field and Company's spelling lesson sheets also show a good adaptation of specific materials to specific ends.

---

[10] See Reference 7, of this Chapter.

[11] Ref. 19, pp. 200 *et seq.*

That lesson sheets have some decided advantages over textbooks, will scarcely be questioned, but that they are subject to most of the faults of textbooks and some others besides is equally true. A clear, simple literary style, broad and up-to-date knowledge, accuracy of statement, careful editing, and good printing are requirements that apply to lesson sheets fully as much as to textbooks.

The chief advantages of loose-leaf lesson sheets are:

a) they are readily reorganized and revised;
b) they bring a feeling of novelty with each new lesson;
c) they bring to the students a suggestion of a nearer approach[12] to real business;
d) they are more flexible, permitting the adaptation of a course to local conditions, to particular classes, and to individual students.

The serious faults to which they are subject are:

a) poor organization, and lack of coherence and unity,
b) a tendency to faulty sequence of course topics,
c) lack of broad scholarship, and
d) careless editing and poor printing.

A summary of these discussions of textbooks and lesson sheets, in the writer's opinion, warrants the conclusion that, on the whole, public secondary schools and technical schools use better organized lesson materials than do corporation schools.

---

[12] Ref. 27, p. 202.

PART THREE

CHAPTER IX

SUMMARY OF CONCLUSIONS—THE COÖPERATIVE SCHOOL, A SOLUTION OF THE PROBLEM OF VOCATIONAL EDUCATION

It is now in order to discuss the corporation school from the point of view of the main question of this study: "In what way can the corporation school and the public school be mutually helpful in the solution of the problem of vocational education?"

The need for vocational education has been gradually dawning upon the American people for the past three decades, and society is now fully awake to its importance. While the movement is still in its formative state, it has become crystallized in the foundations established by private agencies,[1] in the legislation of nine[2] states and many municipalities.[3] The main outstanding feature of the movement, aside from its real purpose, is the lack of agreement as to the best means of providing vocational training.

Before undertaking to answer the question as to how the corporation school may contribute to the solution of the problem, it is pertinent to summarize some recognized fundamental principles as to the character of education in a democracy.[4] The course of evolution through which these principles have come, the bitter conflict, the heroic battles, the temporary defeats, the discouraging recessions, and the final triumph, constitute some of the most romantic and heroic pages in the history of the growth of democratic principles. It is not pertinent here to recite the story, except to enumerate the results. These fundamental principles of education in America are:

---

[1] National Society for the Promotion of Industrial Education; American Federation of Labor, Com. on Industrial Education; National Education Association, Com. on Vocational Education; National Association of Manufacturers, Com. on Industrial Education, Refs. 24, 28, 28a, 30; Ref. 24, p. 232.

[2] Reports Commissioner of Education, 1914-'15-'16.

[3] See Tables III and VIII.

[4] Elliot, C. W. *Function of Education in a Democratic State.* Mann Horace, *The Ground for the Free School System.* Ref. 40, pp. 97 *et seq.* Ref. 41, Chap. III.

1. EDUCATION IN A DEMOCRACY MUST BE UNIVERSAL.[5]

This principle means that the door of opportunity must be open to all; limited only by the ability of society to provide the opportunity, and by the pupil's intellectual and physical ability to profit by it.

2. EDUCATION IN A DEMOCRACY MUST BE FREE.

The assumption by society of the financial burden of educating its citizens has come about only after a long and bitter struggle, and while the acknowledgement is almost universal in America, the universal practical application of this ideal is still unrealized. Yet this realization is approaching fulfillment, as is evidenced by added educational opportunity and increased appropriations for education every year.[6]

3. EDUCATION IN A DEMOCRACY MUST BE COMPULSORY.

This principle, long ago accepted in Europe, and nominally accepted in America quite as early, is the latest one to be acknowledged by public sentiment; and even now several states, and many individuals have not reached the point where they are willing to act upon this principle.[7]

---

[5] Ref. 1. pp. 97-98.
[6] Report Commissioner of Education, 1916. Vol. II, p. 8.
[7] Monroe's *Cyclopedia of Education.*

4. EDUCATION IN A DEMOCRACY MUST BE NON-SECTARIAN.

This principle means that education, in order best to serve democratic ideals, must not be subject to any control more restrictive than the broadest ideals of a democratic state. This principle is inherent in American Democracy.[8]

5. EDUCATION IN A DEMOCRACY MUST BE A SOCIALIZING FACTOR, AND MUST CONTRIBUTE TO SOCIAL EFFICIENCY.

This principle means that education must "bring people and classes into closer and more perceptible connection with one another. It means not only freer interaction between social groups . . . . but change in social habit, and continuous readjustment."[9] Social efficiency,—*i. e.*, the ability of the individual to act his part as a social unit, supporting himself and contributing to the common good in proportion to his intellectual and physical endowment, and placing a minimum of burden upon society in case of deficiency in these gifts—is society's chief warrant for the establishment and maintenance of schools.[10]

6. EDUCATION IN A DEMOCRACY MUST BE CONTROLLED BY THE STATE.

This principle has been accepted only after control by the family, by the church, and by private or philanthropic enterprise, has been found wanting, and only after the state has become conscious that its own permanence can only be assured by universal education under state control.[11]

---

[8] Ruffini, Francesco, *Religious Liberty*, trans. by Burg and Haynes Ref. 46, pp. 228-5.

[9] Ref. 40, pp. 99-100.

[10] Ref. 41, Chap. III.

[11] Ref. 40, pp. 108-115, Ref. 16, p. 874, Ref. 22, p. 775.

The application of these six principles to vocational education, as well as to general education, is now so nearly universally accepted in the United States that their universal acceptation may be assumed. These six fundamental principles constitute a measuring rod by which may be gauged the efficiency of the service to the community of any individual school, or any system or type of schools. In the following paragraphs, this measuring rod is applied to the corporation school.

The corporation school cannot become universal. It is now reaching less than one half of one per cent of the industrial workers in the United States.[12] Business reasons require the corporation school to select the best and to eliminate the inferior applicants. This selection[13] is the one feature which has for the past decade arrayed the American Federation of Labor[14] against any form of privately controlled vocational education. In addition to this selective feature, financial and geographical limitations are further reasons why the corporation school cannot become universal, and all are reasons why it cannot become compulsory or free. The question as to its non-sectarian character needs no discussion.

The corporation school contributes to social efficiency;[15] it may also be controlled to a limited degree by the state, as is the case of many such schools in European countries.[16] These two conditions lead the writer to the conclusion that some form of coöperative organization between the corporation school and the public school will be the chief factor in the ultimate solution of the problem of vocational education. This point is developed further in the concluding paragraphs of this chapter.

---

[12] See Chapter III.
[13] See Chapter III; also Ref. 19, pp. 715-716; Ref. 31, p. 126.
[14] Refs. 24 and 25.
[15] See Chapter IV.
[16] Ref. 20.

The discussion of corporation school efficiency in Chapter IV shows that:

1. They tend to produce an adequate supply of young employees to meet the demands of industry.
2. They supply the demand for men qualified for promotion to higher positions.
3. They improve the character of work and the quality of the products.
4. They reduce the turn over of labor, or increase the tenure of employees.
5. They tend to reduce waste of materials and the number of accidents by improving working conditions and by reducing carelessness and ignorance.

The conclusions of Chapter V were that the teaching in public secondary schools and technical schools is superior to the teaching in corporation schools in:

a) classroom management,
b) definiteness of aim,
c) assignment of lessons,
d) breadth of view,
e) development of culture,
f) and recitation technique,

and that the teaching in corporation schools is superior in:

g) responsiveness of class,
h) mental discipline, and
i) class attitude toward learning.

The conclusion of Chapter VI is that the corporation school has what seem to be inherent advantages over public secondary schools and technical schools in such motives and incentives as:

a) the relation of employer and employee,
b) pecuniary interest,
c) the shop situation, and
d) real problems.

The conclusion of Chapter VII is that the curricula and courses of public secondary schools and technical schools show, on the whole, a better logical and pedagogical organization than those of corporation schools, and that the latter are superior in being more specific and in having a closer relation between the materials employed and the ends sought, and that some show a decided superiority in time allotments.

The conclusion of Chapter VIII is that, in the matter of textbooks and lesson sheets, public secondary schools and technical schools are using better organized lesson materials than corporation schools are using.

The opening paragraphs of the present chapter stated the six fundamental principles upon which education in a democracy must be based, and the limitations upon the corporation school which prevent it from being considered a satisfactory solution of the problem of universal vocational education. It was pointed out, however, that the corporation school through its contribution to vocational efficiency, may be an important factor in that solution. While a complete and satisfactory solution of the problem of vocational education has not been found in any of the phases of vocational education which have been studied, in the writer's opinion the coöperative trade and continuation school is a nearer approach to that solution than is offered by any other plan.

The reasons upon which this conclusion is based are as follows:

1. **The coöperative trade and continuation school meets in actual practice, or can readily be made to meet, all the conditions of the six fundamental principles formulated above.**
2. **In the coöperative trade and continuation school, it is possible to combine all the points of superiority of the public secondary schools and technical schools and of corporation schools which have been found in the matter of instruction, methods, motives, lesson materials, and curricula.**
3. **The coöperative trade and continuation school is a success in actual practice.**
4. **The coöperative trade and continuation school has the sanction of many of the educators, business men, labor leaders, legislators and**

social workers who have given most thought to the matter of vocational and industrial education.

The experience of several states[17] and numerous municipalities in the United States in establishing and conducting some form of continuation school or coöperative trade school demonstrates the first of these propositions, and the experience of Germany, France and England in establishing and maintaining such schools is further evidence on this point.[18]

The second proposition is based upon the evidence of this study presented in Chapters IV to VIII, inclusive, which shows that corporation schools are superior in those phases of organization and administration of instruction in which public schools are confessedly weak, while these are strong where corporation schools are weak. The coöperative trade and continuation school furnishes the essential conditions for emphasizing these strong points and for eliminating or minimizing these weaknesses.

The third proposition is justified by the information which the writer has collected by personal observation and otherwise. Company officials are unanimous in the statement that among the results of coöperation are the advantages discussed in Chapter IV. Among the coöperative schools visited was the Cass Technical High School of Detroit, which is working in coöperation with thirty-one companies. These companies report that their employees are from fifty to one hundred per cent better workmen because of the instruction received in the continuation school. So satisfactory is the work that there is at present (February, 1917) a long waiting list of applicants for admission.[19] This school offers both trade and continuation courses.

---

[17] Vocational Education, Reports Commissioner of Education, 1914-15-16.

[18] Refs. 18, 21.

[19] Circular: Industrial Part-time Continuation Classes, Cass Technical High School.

The writer has also secured information from a large number of other schools, either through school authorities or coöperating concerns, and this evidence substantiates the statement that the coöperative school is successful. The National Cash Register Company of Dayton, Ohio, is working in coöperation with the Dayton High School, and Mr. Adkins, for the Company, pronounces the work a success.[20]

The coöperative school seems to be a natural outgrowth of the corporation school. The R. Hoe Printing Press Company, of New York City, which established the first corporation school in the United States has recently (1915) entered into an agreement whereby the city Board of Education supplies all the teachers for the academic work of the apprenticeship school.[21] The General Electric Company, of Schenectady, New York, which has maintained a training department for many years has recently entered into a similar agreement with the Board of Education of Schenectady,[22] and the plan is still (1916) in operation. Many similar cases are reported from England.[23]

The Seventeenth Annual Report of the Superintendent of Schools of New York shows that ten high schools are coöperating with sixty-three firms covering twenty-three occupations. The report also shows that coöperating schools are maintained in twenty-six business houses, including department stores, hotels, railroad shops, and public service companies. In these schools the companies furnish the schoolrooms and the board of education, the teachers. This report states ten conclusions based upon experience. Two of these are: "The industry profits by the plan by securing better employees." "The plan does not necessarily prolong the period of high-school attendance for graduation."

---

[20] Ref. 19, pp. 808-814.
[21] Ref. 27. p. 182.
[22] Ref. 19, pp. 287-288.
[23] Ref. 18, pp. 282, 289, 294, 801, 870.

Table VIII shows a partial list of coöperating schools and companies from whom information has been secured.

TABLE VIII.

Companies	Schools
Brighton Mills	Passaic N. J. H. S.
Burroughs Adding Machine Co.	Cass Technical H. S. Detroit
Chicago Telephone Co.	Central Y. M. C. A.
Consolidated Gas, Elec. Light and Power Co.	Baltimore Night School
Simonds Manufacturing Co. and nine other companies.	Fitchburg, Mass. H. S.
United Shoe Machinery Co.	Beverly, Mass. H. S.
Six Companies	York, Pa. H. S.
Thirty-nine printing companies	Chicago Typothetae School of Printing
Six Department stores	Union School of Salesmanship, Boston
Sixty-three companies	New York City High Schools
Twenty-six other organizations aside from the above	New York Board of Education (schools in company buildings).

If to this list be added the schools for higher training listed in Table III the momentum of the coöperative movement may be appreciated. The reports from these schools and the companies coöperating with them show no disposition to doubt that the coöperative school is a satisfactory and permanent solution of the problem of vocational education.

The fourth proposition is a matter of the weight of cumulative opinion. While the coöperative plan of vocational education does not enjoy unanimous support of those who are interested in the problem, it does have the support of many of the strong men in this field.

Mr. C. A. Prosser, says[24] that the continuation school under state support and control is the most modern and up-to-date means of educating the young worker.

Dr. David Snedden, until recently Commissioner of Education of Massachusetts, says[25] that the part-time coöperative school is destined to become a permanent form of vocational education, and that nothing short of legislation compelling town and shop to coöperate, will ever give to us, as it gave to early England and modern Germany, a national system of industrial education. He says further that the belief is rapidly gaining ground, that a large part of vocational education should be obtained through actual participation in the pursuit, under commercial conditions, of the occupation itself, but so controlled as to make education rather than earnings the chief objective, and that such participation must be under the direction of the agency responsible for the effective vocational education of the novice.

---

[24] N. A. C. S. Bulletin, July, 1916.

[25] Ref. 22a, p. 49.

The Hon. W. C. Redfield says:[26] "What is needed is a complete system of vocational education with due relation to industry."

The Report of the Committee on Vocational Education of the National Education Association, composed of twelve prominent educators and representative men interested in vocational education states:[27] "that theoretically vocational education under the coöperative system should ultimately prove most effective, depending upon the effective coördination of the separate agencies,[28] . . . . and experience has shown that this coördination is perfectly possible."

Dr. Clifford B. Conelley, of the Carnegie Institute of Technology, expresses the opinion that if we take away the direct backing of the corporation and leave the corporation school with all its essential details as organized by the company, we have the school best fitted for modern conditions. This would really be the continuation school.[29]

R. S. Cooley, director of continuation schools in Milwaukee, states[30] that "In one year, the continuation school brought back into school 5,000 young people under sixteen years of age, who had left school to work.

---

[26] N. A. C. S. Bulletin, July, 1916.

[27] Bureau of Education, Bulletin 21, 1916.

[28] Report Committee on Vocational Education, N. E. A. 1916.

[29] Journal N. E. A. pp. 412 *et seq.* 1916.

Dr. George Myers,[31] who has made a special study of vocational education in Germany, concludes that any satisfactory solution of the problem of vocational education must include some form of coöperative school work, and that the continuation school idea is growing in Prussia.

Supt. John D. Shoop, of the Chicago schools emphasizes the fact that vocational education must come through coöperation. "The interplay of interest between the school and the shop, the classroom and the commercial world, constitute the most promising and hopeful indication of the final solution of the problem of vocational education."[32]

CONCLUSION

The argument of this summary of conclusions, of personal opinions, and of committee resolutions, is further strengthened by the facts that, within the past five years seven states have provided by legislation[33] for some form of coöperative or continuation school for industrial and vocational training, and congressional enactment in the Smith-Hughes Bill,[34] has recently provided for federal aid for vocational education. The writer believes that this evidence justifies the conclusion that the coöperative trade and continuation school is the solution of the problem of vocational education.

---

[30] *op cit.*

[31] Ref. 20.

[32] *Journal,* N. E. A. Jan. 1917, p. 112.

[33] Report Commissioner of Education, 1916. (see also next Ref.)

[34] Natl. Society for the Promotion of Indus. Educ. Bulletin 25.

BIBLIOGRAPHY

The following abbreviations are used:

N. E. A. National Education Association
N. S. P. I. E. National Society for the Promotion of Industrial Education.
N. A. O. S. National Association of Corporation Schools.

---

1. Scott, Jonathan French, Historical Essays on Apprenticeship and Vocational Education, Ann Arbor, Mich.
2. U. S. Bureau of Labor, vol. 25, 1910.
2a. Unwin, George, The Gilds and Companies of London, 1908.
3. Dunlop, O. J. and Denham, R. D. English Apprenticeship and Child Labor, T. Fisher Unwin, London, 1912.
4. Kramer, Stella, English Craft Gilds and their Government, Columbia University Press, New York, 1905.
5. Lambert Jos. M., Two Thousand Years of Gild Life, Hull, England.
6. Wright, Carroll D. The Apprenticeship System in Relation to Industrial Education, U. S. Bureau of Education, bul. 6, 1908.
7. Seath, John, Education for Industrial Purposes, Toronto, Canada, 1911.
8. Trade Gilds of Europe, U. S. Consular report, 1885.
8a. National Association of Manufacturers, bul. 34, New York.
9. Bible, I. Kings V. 15, I. Samuel II. 18.
10. Thucydides, I. 24.
11. Plutarch, Numa, 17.
12. Dilts Roman Society in the Last Century of the Empire, bk. II, III.
13. Webster, O. W. History of Commerce.
14. Graves, F. P. Great Educators of Three Centuries.
15. Tawney R. H. The Agrarian Public of the Sixteenth Century, London.
16. U. S. Commissioner of Labor, 17th annual report, 1902.
16a. Cunningham, Growth of English Industry and Commerce, Cambridge, Eng.
17. U. S. Dept. of Labor, bul. 33, 1915.
17a. Hutchins and Harrison, History of Factory Legislation, Westminster.
18. Sadler, M. E. Continuation Schools in England and Elsewhere.
19. N. A. O. S. report third annual convention, 1915. New York.
20. U. S. Bureau of Education, bul. 33, 1915.
21. N. E. A. Proceedings, 1915.
22. N. E. A. Proceedings, 1910.
23. N. S. P. I. E. bul. 14.
23a. N. S. P. I. E. bul. 20.
24. N. S. P. I. E. bul. 20.
25. N. S. P. I. E. report fifth annual convention.
26. U. S. Consular report, Continuation schools in Europe.
27. N. A. O. S. report fourth annual convention, 1916.
28. N. S. P. I. E. bul. 2, bibliography on industrial education.
28a. University of the State of New York, biblography on industrial education.

29. National Society for the Scientific Study of Education, Year book, pt. I, 1912.
30. U. S. Bureau of Education, bul. 22, 1913. Bibliography on Industrial education.
31. N. A. C. S. report first annual convention, 1913.
32. Metcalf, H. C. The N. A. C. S. Times Analyst, June, 1913. The corporation school movement, Printers' Ink, June 5th, 1913. Henderschott, F. C. The N. A. C. S. in proceedings American Institute of Electric Engineers, June, 1913.
33. N. A. C. S. second annual report, 1914.
34. National Safety Council, proceedings fourth annual convention.
35. National Association of Manufacturers, bul. 22.
35a. National Association of Manufacturers, Industrial Education in Pennsylvania and Wisconsin.
36. The Ford Guide, Ford Motor Co.
37. English School circular, Ford Motor Co.
38. Cassiers' Magazine, vol. 23, p. 199.
39. Davis C. O. High School Courses of Study.
40. Dewey, J. Democracy and Education.
41. Bagley, W. C. The Educative Process, Chap. III.
42. Advance report codification committee N. A. C. S. 1916.
43. U. S. Bureau of Education, bul. 37, 1916.
44. N. S. P. I. E. bul. 11.
45. Wilson H. B. and G. W. Motivation in School Work.
46. Russell, J. E. German Higher Schools.

RETURN TO ➡ **CIRCULATION DEPARTMENT**
202 Main Library

LOAN PERIOD 1 **HOME USE**	2	3
4	5	6

ALL BOOKS MAY BE RECALLED AFTER 7 DAYS
1-month loans may be renewed by calling 642-3405
6-month loans may be recharged by bringing books to Circulation Desk
Renewals and recharges may be made 4 days prior to due date

DUE AS STAMPED BELOW

APR 30 1978

May 30, 1978

REC. CIR. JUN 1 '78

OCT AUG 1986 DISC

MAY 20 198

FORM NO. DD 6, 40m 10'77 UNIVERSITY OF CALIFORNIA, BERKELE
BERKELEY, CA 94720

YB 45643

GENERAL LIBRARY - U.C. BERKELEY

B000927767

410277

LC5051
B42

UNIVERSITY OF CALIFORNIA LIBRARY